The Electrical Industry's Weekly Magazine

December 17, 1956

Electrical World

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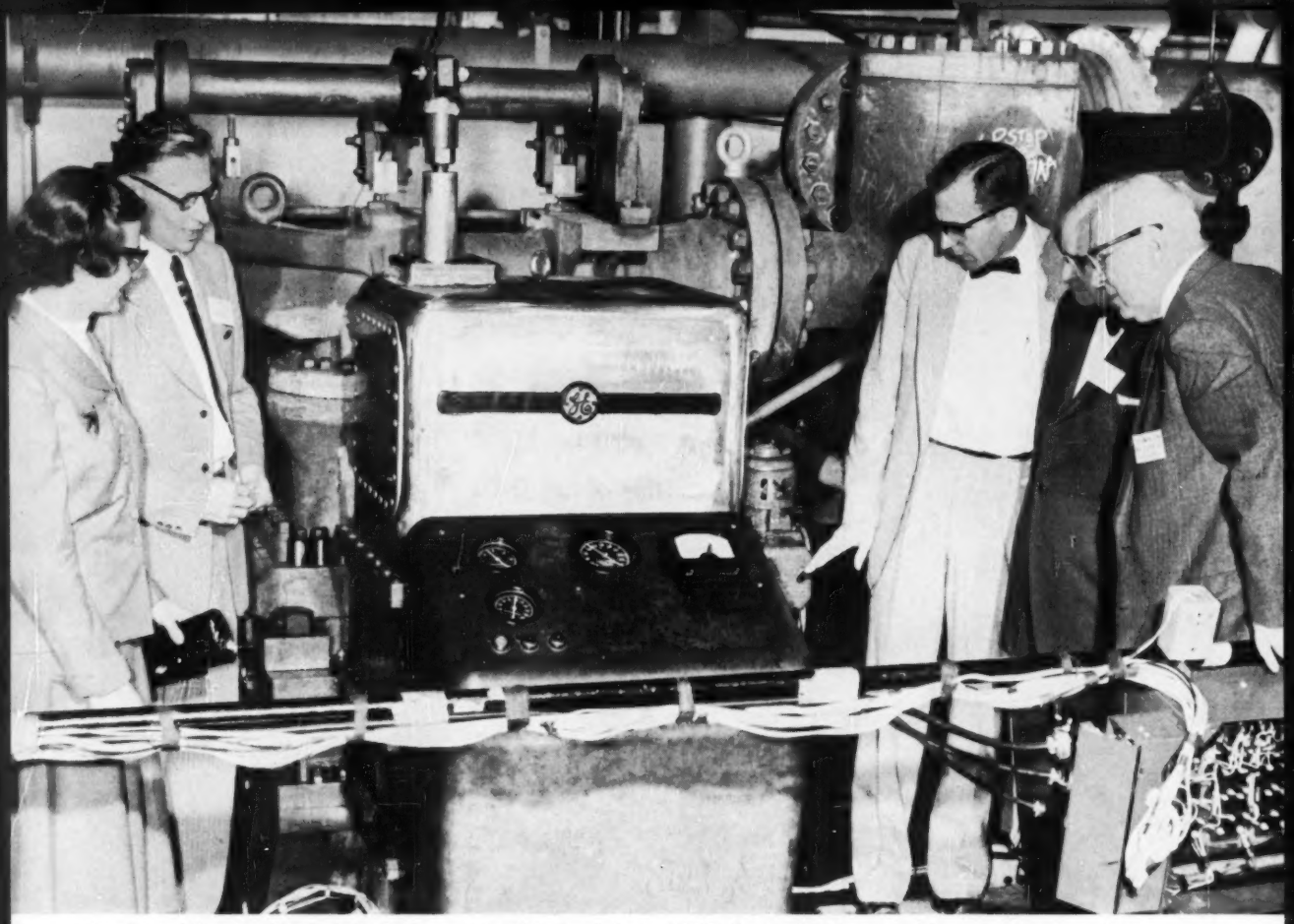
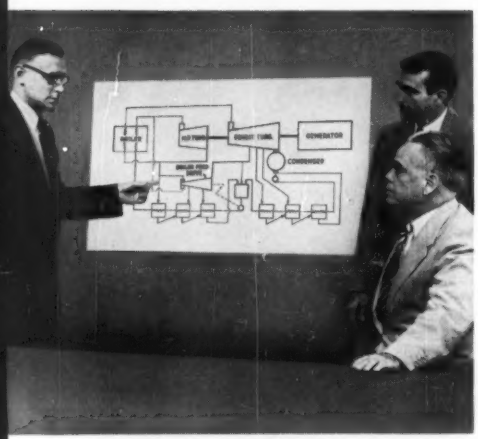
Lights Help Inspire the Christmas Spirit . . . p 8

E B POWER GS W 1
UNIVERSITY MICROFILMS 1
313 N 1 ST
ANN ARBOR MICH



New General Electric turbine for boiler feed pump drive will be installed at the Appalachian Electric Power's Glen Lyn plant on the American Gas & Electric system. Main turbine is rated at 225,000 kw at 2000 psi, 1,050F/ 1,050F. Above, editorial personnel from utility industry publications witness testing of the first of several turbine drives for boiler feed pumps at General Electric's Small Steam Turbine Department's Fitchburg, Mass. plant.

Larger units and higher auxiliary power demands spotlight turbine drives for boiler feed pumps



DISCUSSING NEW TURBINE DRIVE for boiler feed pump applications are G. B. Warren (seated) V. P. and Gen. Mgr., G.E.'s Turbine Division, C. B. Seelig, Mgr. Mktg., (left) and S. Neal, Mgr.—Design Eng., of General Electric's Small Steam Turbine Department.

With system growth requiring more economical, larger generating units, and orders already placed for machines up to 450,000 kw having steam conditions of 3500 psig, electric utility men are focusing new attention on the use of turbines for boiler feed pumps. According to a recent study by General Electric's Small Steam Turbine Department, as well as independent studies by several utilities, significant economies result when turbine-driven pumps are used with high-pressure turbines of 200,000 kw and up.

From a system design standpoint, turbine drives for boiler feed pumps offer several advantages in that they draw less on the auxiliary power system. Result: electrical auxiliary power system requirements can be reduced, permitting lower transformer and circuit breaker ratings, and more kilowatts can be released as salable power. High-speed pumps—up to 8000 rpm—can be driven directly by turbines with the inherent advantage of variable speed.

Detailed information on the type of application where General Electric turbines for boiler feed pump drives can help you increase station output and profits may be obtained by contacting your G-E Apparatus Sales Office. General Electric Company, Section 301-333, Schenectady 5, New York.

LIVE BETTER ELECTRICALLY

MORE POWER TO AMERICA

GENERAL ELECTRIC

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ELECTRICAL WORLD

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Electrical World

Published for 82 years for those engaged in the business of generating, transmitting, distributing, or supplying electric power

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• • •

COMING NEXT WEEK—The editors will review the activities in their special fields in 1956 and will make some predictions for 1957. This Year-End Issue will serve as a handy reference to the industry's activities in 1956.

Mr. C. J. Cox (at right, above) supervises the installation of Okonite Splicing Tape on 2300 volt motor lead in Seabrook Farms food freezing plant. For 29 years Mr. Cox has standardized on Okonite splicing materials to assure water-tight seals on cables throughout the plant. Note moisture conditions indicated by frozen condensation on pump head.

Okonite Tapes resist moisture, freezing...

keep world's largest food freezing plant operating

For 29 years, Mr. C. J. Cox, supervisor of all construction and engineering for Seabrook Farms Co., has depended on Okonite Tapes to maintain the vast electrical network that keeps the world's largest food freezing plant operating. All electrical circuits (totaling 20,000 h.p. connected load), lights, as well as power for the motors and pumps which provide continuous freezing and storage capacity, are spliced and terminated with waterproof Okonite Tapes to assure positive protection against the moisture always present in the plant.

In every phase of Seabrook's operation, moisture is a problem. Treatment of food, freezing, processing, storing . . . all are damp operations with continuous condensation on cables and equipment alike. Low temperatures of the freezing and holding rooms make splicing difficult.

Okonite Tapes offer effective waterproof splices that are not affected by dampness or low temperatures. Both Okonite Rubber Tape and Okolite High Voltage Tape fuse into a solid self-vulcanizing wall of tough, waterproof insulation. Protected by Manson Friction Tape, splices maintain their moisture resistance through many years of exposure to condensation and freezing temperatures.

Specify Okonite tapes for the tougher jobs. Get them from your Okonite Tape Distributor, or write to The Okonite Company, EW Tape Department, Passaic, New Jersey.

Available through authorized distributors only

OKONITE

splicing materials

3521-A

Courtesy Pacific Gas & Electric Co.

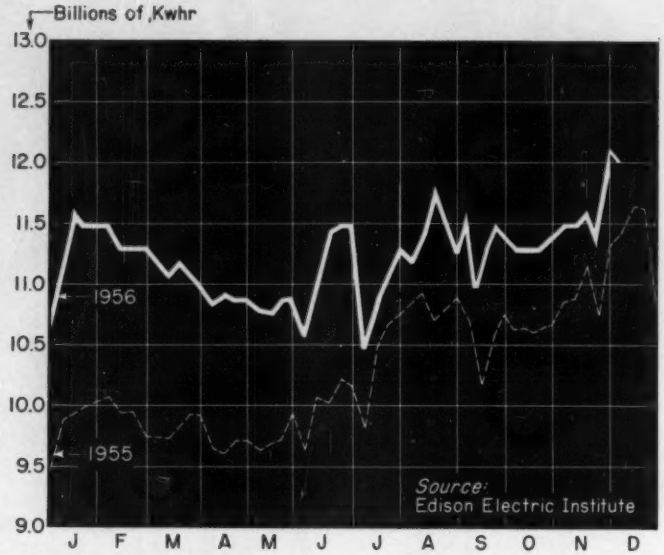
Prayer of Peace

LORD, make me an instrument of Thy peace.
Where there is hatred, let me sow love.
Where there is injury, pardon.
Where there is doubt, faith.
Where there is despair, hope.
Where there is darkness, light.
Where there is sadness, joy.

O DIVINE MASTER, grant that
I may not so much seek
To be consoled, as to console;
To be understood, as to understand;
To be loved, as to love;
For it is in giving, that we receive.
It is in pardoning, that we are pardoned.
It is in dying, that we are born to eternal life.

ST. FRANCIS OF ASSISI (1182-1226)

ELECTRICAL WEEK



OUTPUT

Week ended Dec. 8, 12,047,000,000 Kwhr Up 5.4%

Atomic Energy Commission requirements—1,125,000,000 kwhr (Electrical World estimate). Excluding AEC, output increase was 5.8%

Per Cent Change From Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
Dec. 8	+5.4	+4.1	+2.2	+4.0	+7.5	+3.4	+12.4	+9.3	+10.7	+9.8
Dec. 1	+6.3	+5.9	+4.9	+4.9	+6.1	+7.0	+8.1	+7.4	+9.1	+8.1
Nov. 24	+6.6	+6.9	+4.7	+5.5	+8.7	+7.0	+11.8	+7.1	+5.2	+8.0

Seasonally Adjusted Index 222.4 Week Ago (Revised) 225.1 Year Ago 210.9

Here are the issue's highlights . . . Business will spend 11% more in 1957 than in 1956. Survey shows business capital expenditures heading for stability at a high level. Utilities will lead the pack next year, spending 25% more than this year . . . New England Electric System plans 200-Mw nuclear plant . . . Union Electric has stop-gap program for water shortage . . . AEC postpones PRDC hearings . . . Utility seizure bill killed in Ohio . . . Power Show in New York stresses atom plants . . . Water-cooled stator coils go in 30-Mw English generator . . . Southern Colorado Power tests 25 meters a day at $1.59 each . . . McMeekin plant costs are cut 7½% through more efficient use of existing equipment, a good cooling water source, and optimum plant design . . . Farm competition gets rougher . . . Distribution voltages clarified.

Electric utility spending next year will jump 29%. That's the trend of reports to Electrical World's construction survey from 70% of the industry.

Formation of a power pool and cooperative construction of a three-unit power plant are planned by California Electric Power, Arizona Public Service, and El Centro (Calif.) Imperial Irrigation District. Each utility will build one 80,000 unit for the steam plant, located near Yuma, Ariz.

Middle South Utilities tells AEC it has asked four manufacturers—General Nuclear Engineering, Atomics International Div of North American Aviation, GE, and Westinghouse—to provide a preliminary construction cost estimate for a conceptual design of a 20,000-kw prototype reactor. MSU also asks for estimate for a large nuclear reactor of the same basic conceptual design.

Total "new money" security sales to the public will total nearly $1.5 billion for the year 1956 as compared with $1.4 billion for 1955, according to preliminary figures just released by Reis & Chandler.

NEWS OF THE INDUSTRY BRIEFLY TOLD

Washington Wire . . . AEC Chairman Lewis L. Strauss has given his answer to Democratic charges that AEC is dragging its feet in atomic power development. Evidently with President Eisenhower's blessing, he proposes comprehensive new program of civilian power reactor construction, including five "entirely new type and design" reactors, increased financial aid to industry, greater release of classified technical data—all of which will be taken up in Congress next year. Major phases of Strauss' new program are:

New power demonstration as quickly as possible. Unlike previous ones, new program would have no cut-off date but proposals would not be considered that did not promise completion of a plant by June 20, 1962. Proposals would be considered individually by AEC as they are received.

No size or type limitation would be placed on any proposal. Governing criteria would be whether a project promised significant contribution toward developing cheap and safe nuclear power.

Priority will be given to three particular types: (1) Minimum 100-Mw capacity natural uranium fueled reactors using heavy water as moderator; (2) Another minimum sized 100-Mw capacity fluid-fueled reactor system based on aqueous solutions and/or slurries or uranium and/or thorium bearing materials; and (3) three small-scale reactors of varying new designs.

Industry will be given first chance to build above reactors. But if acceptable proposals are not forthcoming on all specified types within a reasonable period, AEC would build reactors itself with same 1962 target date.

Last week was a busy one for new security issues. Merrill Lynch, Pierce, Fenner & Beane group wins $15 million Florida P&L first mtg 4⅜% bonds at 100.59; reoffers at 101.257 to yield 4.30% . . . Lehman Bros. group wins 80,000 shares Delaware P&L $100 par 5% preferred stock at $100.219; reoffers at $102 to yield 4.90% . . . Kidder, Peabody & Co group wins $3 million Sierra Pacific Power first mtg 5¼% bonds at 101.2199; reoffers at 102.29 to yield 5.10%. This compares with lone bid of 100.02 for 5⅜% coupon rejected Nov. 14.

ABOUT PEOPLE IN THE INDUSTRY

The solution of "our most pressing problem today—encroachment of government in our business—is within ourselves," declares **Edwin Vennard,** VP-Managing Director of EEI. He said indications show Americans "will be opposed to policies that encourage government encroachment once they are informed of the facts . . . We should all work in unison to meet this common problem" although it will "take time, energy, and wisdom."

A plea for broader education of student engineers was sounded by Atlantic City Electric Pres **B. L. England** to Mexican National Chamber of Electricity. "In addition to technical competence," he said, today's engineer should have "a grasp of architecture, business, economics, politics, sociology, history, and geography . . . Our industry cannot use the narrow technician of limited vision, lagging cultural interest . . ."

More News About People page 36

A LANE OF LUMINOUS ANGELS leads to the traditional giant evergreen which heralds in the Christmas season at New York City's famed Rockefeller Center. The tree is decorated with over 2,000 bulbs and more than 1,000 globes

Lights Help Inspire the Spirit of Christmas

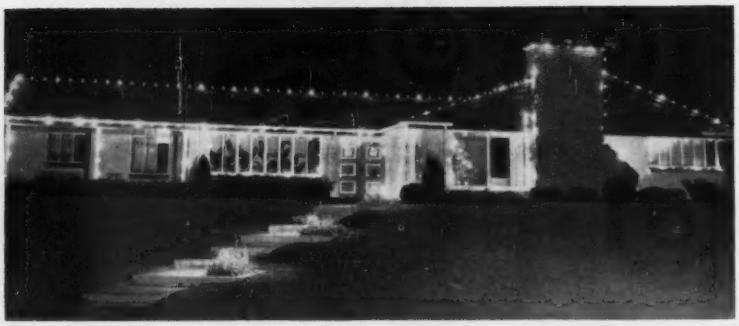
Lights have helped inspire the spirit of Christmas since the night of the bright star over Bethlehem. At General Electric Co's Lamp Division, Clevelanders are being treated to a spectacular display. The Nela Park exhibit includes a 100-ft-tall mechanical Christmas tree (see cover), forged of pipe and bedecked with 5,500 lamps. Part of the exhibit shows how-to-decorate-your-house-outdoors. Denver's Civic Center (pictured in part on these pages) requires 33,000 lights. The Kansas City Country Club Plaza requires 20,000, and 60 mi of wiring. Elsewhere, lights are twinkling again as shown here. . . .

SYMBOLIC STARS shine down on Chicago from the top of the city's Water Tower Building and from the windows of the Palmolive Building

A FEATURE OF "THE GREATEST STORY EVER TOLD . . . IN LIGHTS" at Nela Park, Cleveland, is this portrayal of a cathedral's interior formed by lights twinkling in elm trees

IN MAGNIFICENT SPLENDOR, Denver's stately City and County Building extends a glowing welcome to the Yuletide season

RESEMBLING A TOY TOWN of twinkling lights, Kansas Power & Light facilities are brilliantly decorated with thousands of tiny bulbs



STRIKING IN ITS SIMPLICITY, this home in Denver is outlined with many shining lights

THESE TALL GLOWING CANDLES enkindle the Christmas spirit for residents of this home in Mineola, Long Island, N. Y.

VOLTAGE REGULATORS

NEW LOAD BONUS FEATURE on all standard self-cooled ±10% 3-phase step regulators rated 750 KVA and below gives up to 130% capacity at ±5% regulation. *Raise* and *Lower* ranges are independently adjustable without de-energizing regulator.

NEW LRT-68 SWITCH on 3-phase step regulators rated 1000 KVA and below offers doubled contact life and quieter operation. New Geneva gear and hydraulic dashpots provide quick, smooth switch action.

NOW: 30% More Current Capacity on General Electric 3-phase Step Regulators

MLT-32 REGULATORS 750 KVA AND BELOW PROVIDE THIS LOAD BONUS

Regulating Range	Current Capacity
% "Raise" or "Lower"	Percentages of Rated Amperes
±10	100
± 8¾	108
± 7½	115
± 6¼	120
± 5	130

GREATER CURRENT CAPACITY is now available on all standard General Electric self-cooled ±10% MLT-32 three-phase step voltage regulators rated 750 KVA and below.

Simple external adjustment of Load Bonus switch, conveniently located at the position indicator, limits regulating range and increases current capacity up to 130% of rating. Raise and Lower regulating ranges are independently adjustable, and all settings can be made without de-energizing the unit.

DOUBLED LIFE of heavier Arconite contacts in LRT-68 switch used on G-E 3-phase step regulators rated 1000 KVA and below, means greatly reduced maintenance expense.

QUIETER OPERATION—Redesigned Geneva gear lowers friction; gives 20 db reduction in peak switching noise. Mechanism and drive motor completely oil-immersed.

CONTROLLED SWITCHING SPEED—Hydraulic dashpots (similar to shock absorbers) reduce arcing and shock to a minimum; cut maintenance.

For full information on General Electric's complete regulator line, contact your G-E Apparatus Sales Representative, or write Section 423-13, General Electric Company, Schenectady 5, N.Y.

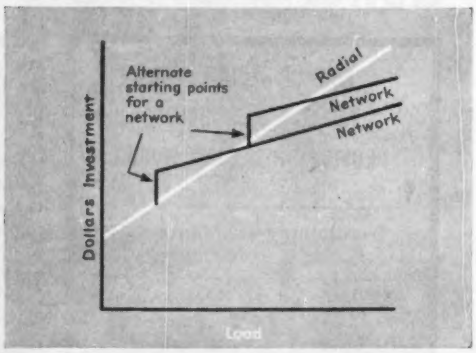
Progress Is Our Most Important Product

GENERAL ELECTRIC

STRAIGHT-LINE INSTALLATION of network transformers in vehicular tunnel proved fast, economical.

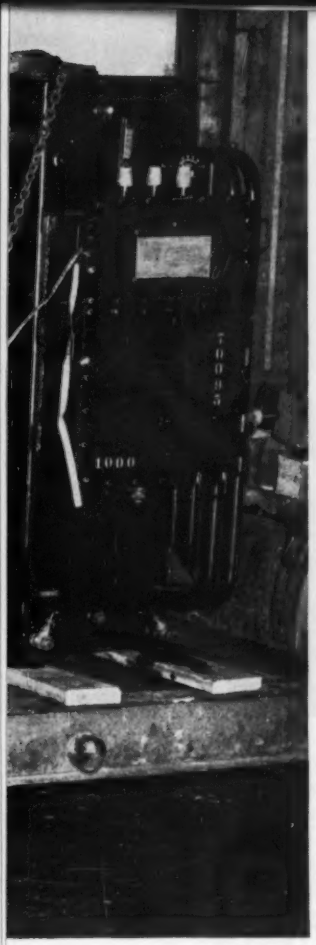
How G-E network transformers help Long

IT PAYS TO START A NETWORK

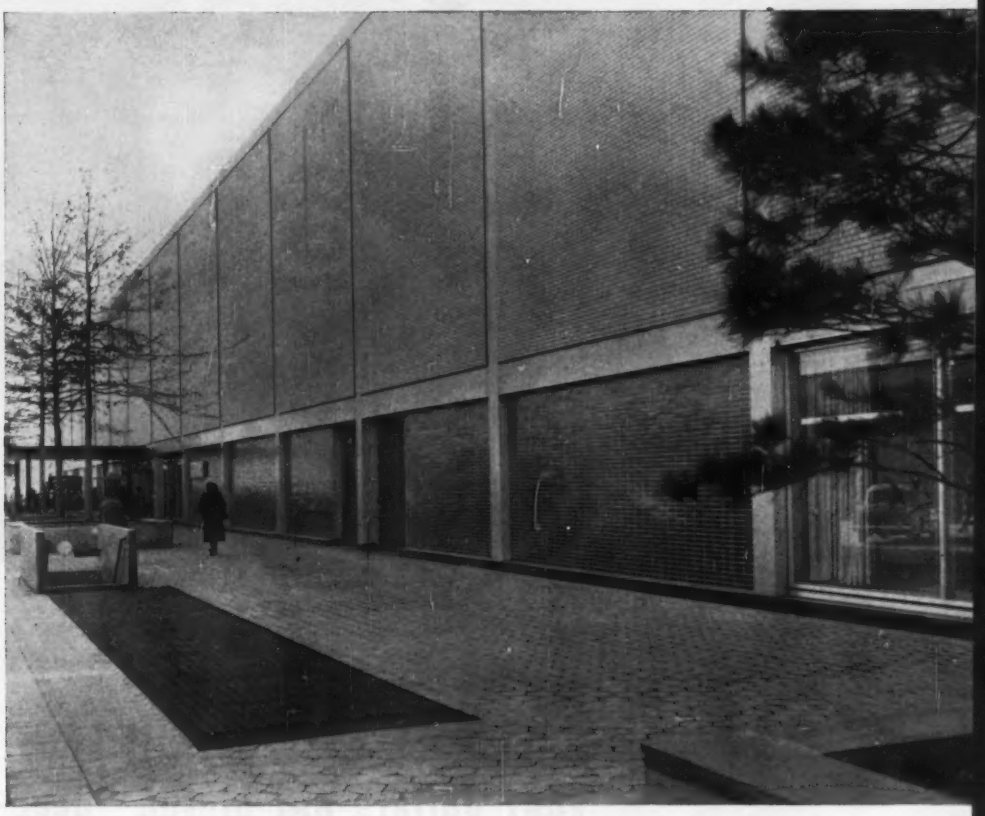


IF YOU INSTALL a network system initially you can economically accommodate load growth in the future.

EASY INSTALLATION. Crew simply moved each 1000-kva General Electric transformer by truck through tunnel to within a few feet of mounting position, skidded each unit into place, and made connections.



WORLD'S LARGEST SHOPPING CENTER, ROOSEVELT FIELD, L. I., N. Y.



TRANSFORMERS UNDERGROUND help maintain modern appearance of shopping center.

Island Lighting Co. solve power problem

L.I. CREW MAKES SPACE-SAVING INSTALLATION OF GENERAL ELECTRIC TRANSFORMERS AT WORLD'S LARGEST SHOPPING CENTER

Construction of the world's largest shopping center at Roosevelt Field, Long Island, posed today's familiar problem—how to best meet an immediate demand for power and also provide for future growth.

Long Island Lighting engineers selected the underground network system because it offers:

1. **Stable Voltage Conditions**—Voltage drop is far less with a network than with a radial system, especially under heavy load demands.

2. **Maximum Dependability**—Units are submersible for underground service—out of harm's way.

3. **Low Cost Expansion in Future**—New loads and new transformers can be added to system without loss of service or the expense of temporary feed arrangements.

4. **Better Appearance**—Use of underground network system is more in keeping with the ultra-modern appearance of the center.

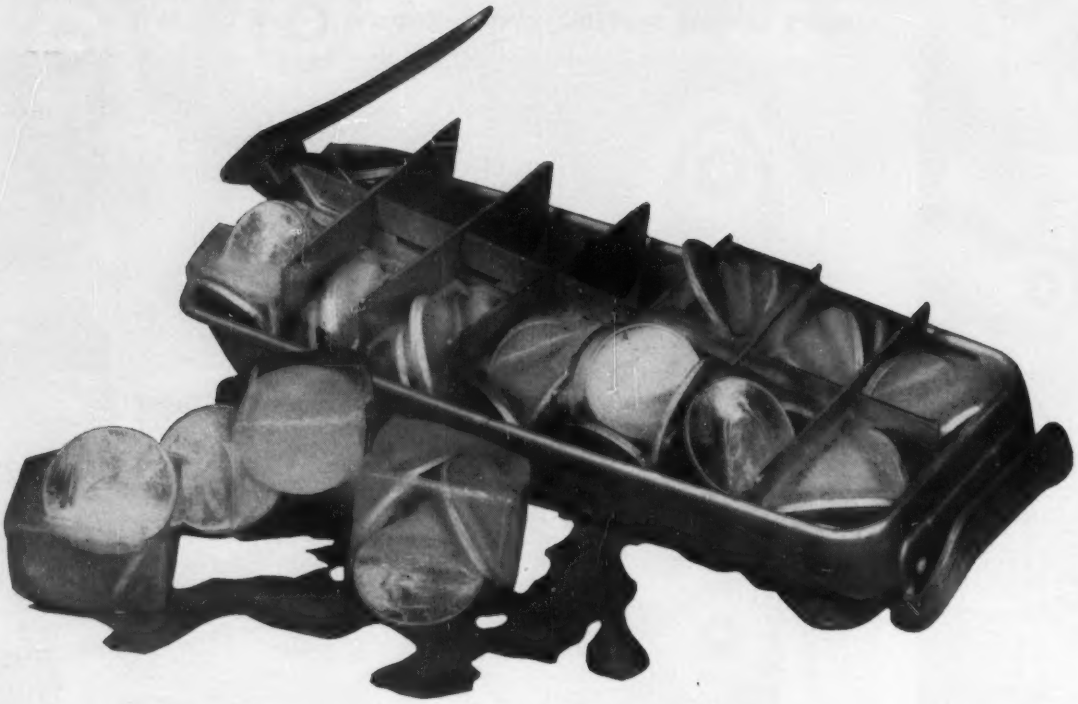
G-E UNITS OFFER EXTRA DEPENDABILITY

Wing-type radiators retard collection of dirt, minimizing corrosion. Maintenance is simplified because there is extra room to reach tubes and tank, either for cleaning or repainting.

HELP FOR YOUR SYSTEM—If you have a radial system and expect load density to reach 50 to 100 kva per 100 linear feet within ten years, investigate the advantages of a secondary network. Get in touch with your G-E representative or write to Section 435-14 for Bulletin GET-2432. General Electric Company, Schenectady, N. Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC



Bushing standards will keep a lot of your dollars out of the "deep-freeze"

Here is how to keep some large sums of invested—and inactive—capital out of the "deep-freeze."

Industry standards are now in effect for bushings in the 23-69-kv range. We are on the threshold of expansion of this activity into the high voltages.

Standard bushings can be completely interchangeable among different station apparatus. A minimum stock of spare standard bushings could provide emergency protection for both present and future equipment. Because modern bushings are designed with reduced diameters, they will usually fit older apparatus as well, with simple adaptations, thus greatly extending the stand-by effectiveness afforded by spare units, and multiplying their economy.

Under the ASA industry program of bushing standards, you need no longer purchase elaborate stocks of special spare bushings that tie-up sizeable blocks of capital in what amounts to a frozen inventory. This is why we say, "Bushing standards will keep a lot of your dollars out of the deep-freeze."

But, remember this—standards relate only to dimensional and electrical characteristics. They don't control a man's knowledge of his business, nor do they control his desire or ability to make a superlative product. In the new O-B bushing, 40 years of experience and fine reputation have been combined with long research and product development, with the very best of new manufacturing facilities, with the industry's leading laboratory, all to produce a bushing of high performance and durability—a bushing that will merit your specification.

OHIO BRASS COMPANY, MANSFIELD, OHIO

Ohio Brass

4649-H

With trailer and truck combination, two-man crew can . . .

Test 25 Meters Daily at $1.59 Each

F. D. HOLLER, Asst Supt, Valley Div, Southern Colorado Power Co, Pueblo, Colo.

Use of a mobile meter testing unit has lowered testing cost to $1.59 per meter in urban areas of Southern Colorado Power Co's Valley Division. The reduction stems not only from testing more meters per day—25 vs 12 previously—but also from eliminating the time of one serviceman and paper work in the division and headquarters offices.

Valley Division, 40 by 25 miles, has about 6,000 meters in eight towns of 600 to 6,000 population and in a thickly-populated farm area. Personnel from division headquarters in Rocky Ford do all the work using a trailer designed and equipped for minimum cost testing. A truck tows the trailer to its work location.

The trailer has interior walls of masonite, a front window, an adjustable roof vent, three screw-type jacks to level and stabilize the trailer, and a hydraulic plunger in the tongue. This plunger operates the brakes in accordance with forward pressure exerted by the trailer against the towing truck.

On the inside the trailer measures 5.5 x 10 x 6 ft. Height from ground level is 8 ft 7 in. The working aisle is 2.5 ft wide and 7.5 ft long. A work bench extends the length of one side of the trailer and across the front. The bench is just wide enough to accommodate a test table equipped with a polyphase quick contactor; potential voltages of 120, 208, 240, and 480; and a photoelectric counter. This equipment cost about $1,100. There is also a watthour meter standard costing $240. All equipment is portable and easily removed for shop use.

Under the front part of the bench is a small air compressor and tank which cost $75. The opposite side has wood bins padded with foam rubber for extra meters and steel bins for repair parts. These bins cost about $50. Wiring, labor, and miscellaneous items amounted to $1,050 bringing total cost of the trailer and equipment to about $4,000.

In operation, the trailer is connected to secondary distribution in a central location. The truck is uncoupled and used to pick up meters to be tested. In one hour the two-man crew can pick up about 30 meters.

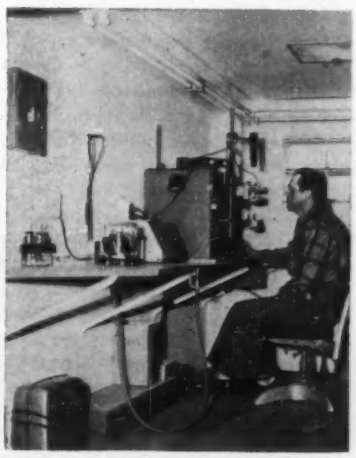
After a preliminary test for record, meters are disassembled, cleaned, repaired, reassembled, tested and calibrated. Meters are then reinstalled in the same sockets from which they were removed, thus eliminating the need for meter record changes in the accounting departments.

Maximum number of meters tested per day has been increased to 25, and the cost has been cut from about $4.50 to about $1.59 per meter. This is based on operation in an urban residential area. Cost per meter in rural areas runs higher because the trailer must be moved more often.

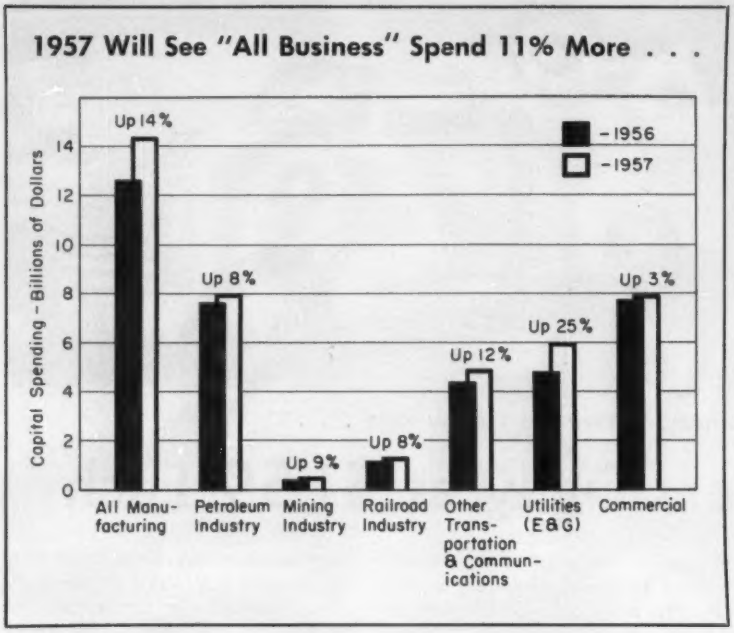
In addition to towing the trailer, the truck is used by the meter and service departments in reading all meters in the division in four days. It is also used for other miscellaneous duties.

Previously, all meters that had not been tested within seven years were changed-out and tested in the shop. This required one serviceman and truck in the field, time in the Rocky Ford and Pueblo (main) offices, and shop time for test and repair. The truck-trailer combination was selected for most economical use of rolling stock and to enable one journeyman and one apprentice to handle all shop, periodic, and complaint tests.

The test trailer was built by a Denver manufacturer under supervision of Meter and Service Supt Bennett Short assisted by Meter Foreman F. J. Ikelman, according to plans prepared by Southern Colorado Power Co.



TEST EQUIPMENT Includes polyphase quick contactor, variable voltage supply, photoelectric counter, and standard, all removable for use in shop



. . . With Exception . . .

Spending Plans for Selected Industries:	% Change 1956–57
Agricultural Machinery	60
Constr. & Mining Mach.	26
Engines & Turbines	77
Industrial Machinery	**–13**
Metalworking Machinery	**–13**
Office Machinery	25
Special Machinery	**–31**
Aircraft	56
Railroad Equipment	50
Heating Apparatus	11
Instruments & Controls	**–8**
Drugs	21
Soaps, Fats & Oils	**–9**
Rayon Chemicals	8
Cement	**–28**
Canning	22
Flour Milling	16
Tobacco	18
Broadwoven Textiles	**–26**
Airlines	17

1957 1958 : Utilities Will Be Leading the Pack

"All business" will spend $40.2 billion next year—in contrast to the $36.3 billion it spent this year. Most elements are strong, but manufacturing is weakening

It now appears business capital expenditures are heading for stability at a high level

Electric and gas utilities will be leading the pack in 1957 with a 25% increase in planned capital expenditures. They are budgeting $6 billion for 1957. The estimated 1956 expenditure is $4.8 billion (see chart).

In comparison, utilities spent an estimated 11% more this year than last.

This is revealed by a preliminary survey of U.S. business plans for capital expenditures in 1957 and 1958 by McGraw-Hill's Department of Economics. (Watch for Electrical World's own survey covering only electric utilities. It will appear in EW's 53rd Statistical Issue Jan 28.)

The planned $6-billion expenditure next year "is so large that it will be difficult to achieve," states the McGraw-Hill report. "But together with strong advance plans for 1958, it indicates the magnitude of expansion in these industries over the two-year period. One-third of the electric utilities already plan higher spending in 1958—and another third, to spend at least as much (see table). So with the potential carry-over, it seems clear that 1958 will see another substantial gain in this area."

Business Still Booms . . .

For 1957, business now plans to increase spending 11%—compared with an increase of 21% in 1956. Plans for new plants and equipment total $40.2 billion for all business. This compares with $36.3 billion in 1956.

. . . But '58 Is Weaker

Advance plans for utilities are stronger for 1958 than they were a year ago for 1957. This may offset any weakness developing in 1958 in the manufacturing industry.

Advance plans for manufacturing do not appear as strong for '58 as they were a year ago for 1957. Last fall, 74% expected to maintain or increase spending in '57. Only 26% planned to cut. Now 32% plan a cut in spending.

But for next year, most lines of manufacturing companies are planning higher expenditures. Largest increases are in steel, nonferrous industries, chemicals, and oil refining.

Electrical machinery manufacturers plan to spend 17% more next year than they did this year. And their outlook on 1958 is even better.

Some Now Falter . . .

The survey, however, shows some declines in comparison to 1956. Spending planned by the auto industry, and companies making residential building materials, textiles, and miscellaneous consumer goods (apparel and furniture, for instance) will be down. These are, of course, the industries where demand has been slack in 1956.

The 20% drop in auto company spending also reflects the absence of a major model change in many lines, after large expenditures in 1956 for that purpose. Lower profits and credit

. . . But 1958 Estimates Show Conservatism

With Respect to 1957, Preliminary 1958 Investment Plans Show:

	% Answering		
	Up	**Down**	**Same**
ALL MANUFACTURING	22	32	46
Iron & Steel	32	42	26
Nonferrous Metals	14	50	36
Machinery	27	30	43
Electrical Machinery	29	29	42
Autos, Trucks & Parts	14	21	65
Transportation Equipment (includes Aircraft)	19	34	47
Chemicals	26	37	37
Paper	29	46	25
Rubber	42	8	50
Stone, Clay & Glass	17	40	43
Food & Beverages	18	30	52
Textiles	15	34	51
Miscellaneous Manufacturing	17	28	55
ALL BUSINESS	24	30	46
Mining	19	29	52
Petroleum	17	17	66
Railroads	8	13	79
Other Transportation & Communications	39	29	32
Electrical Utilities	**33**	**33**	**34**
Commercial	29	26	45

in Capital Spending

difficulties factor into the decline in textiles and miscellaneous manufacturing.

. . . Especially Commerce . . .

With an eye to 1957 expenditures, the weakest spot is commercial business. Despite higher price for construction and equipment, planned expenditures are up only 3%—indicating a drop in physical volume of investment. Next to manufacturing, commercial business firms make up the largest sector of business. Thus the lag in their expenditures has a substantial effect on the total for all business.

. . . But Stability Is Coming

All factors considered, business capital expenditures are heading for stability at a high level. Most companies plan to spend more in 1957 and to hold this high level in 1958.

Although this is the biggest and longest capital spending boom on record, no downturn is yet in sight.

In manufacturing, the total for 1957 is $14.4 billion—up 14%. This compares with a 34% jump in 1956. Commercial business, the oil industry, mining, and railroads also plan a slower rate of increase than in 1956.

For 1958, about two-thirds of the companies surveyed plan to hold or step up their spending from the 1957 level. Only 30% expect to cut back.

Costs Are Climbing . . .

Business expects the prices paid for new plants and equipment to be about 6% higher in 1957 than in 1956. This is, of course, an average for all types of equipment and construction to be installed during the year. Therefore, the price of any one item may vary widely. But the average indicates roughly how much of the increase in capital spending is due to price increases.

Difficulties in construction, and in delivery of equipment, have delayed some 1956 expenditures until 1957. In some industries, a part of '57 spending is being rescheduled for 1958. Cash shortages—resulting from lower profits and tight credit conditions—have been important also in some cases. However, the main effect has been to stretch out plans for expenditures.

. . . While Mid-East Sizzles

Neither the elections nor the Suez crisis have had any significant effect on plans to date. Only 3% of the companies surveyed said their plans have been changed as a result of the election. It seems possible that new plans may develop eventually as a result of the foreign crisis. But spending goals for 1957 are only about 6% higher than the early plans for 1957 reported last spring.

(This is about the amount of spending earlier planned for 1956 which was deferred. So the increase, over early estimates, evidently represents a carry-over from '56—rather than a new surge of investment plans.)

Spending May Climb . . .

Although the McGraw-Hill survey is based on preliminary plans of companies surveyed, the reports in the past have pointed accurately to trends in capital spending. In the last two years—which have been years of rising business activity—final budget plans have been somewhat higher than the advance estimates.

. . . Especially in Mining

The mining industry plans to spend 9% more in 1957 than in 1956. Large increases are planned to develop resources of iron and nonferrous ores, in support of steel and nonferrous manufacturing programs. Most of these programs are planned to continue at a high level in 1958.

Coal companies now report somewhat lower plans for 1957-58 than for 1956. But in the past, these companies have been extremely conservative in their preliminary estimates.

. . . And in Oil

The oil industry has a tremendous program underway to expand and upgrade refinery capacity. Expenditures will be up 50%. Higher quality gasolines are requiring more intricate processes which cost more per barrel of capacity. Construction difficulties plagued the 1956 program and present objectives may not be reached before 1958.

At the time the survey was taken, crude oil producers had plans for only a small increase in expenditures during 1957.

As mentioned previously, commercial budgets are down—particularly for stores in large shopping centers. Some very large centers have been completed recently, but mortgage credit for this type of development has become increasingly hard to get.

But, all considered, the picture for the next two years is bright. Electric utilities can look ahead to a load that will continue to grow vigorously.

Coming: Another A-Plant

New England Electric System will build by 1963 or '64 a nuclear-powered plant of 200 Mw capacity or more. Studies already are under way to determine the most appropriate reactor in the light of integrating the plant in NEES' power network.

The proposed plant should be more economical than the Yankee Atomic Electric's 134-Mw plant, says Pres Irwin L. Moore, because designers will have the benefit of experience gained with Yankee's Rowe plant. (NEES is a charter member of Yankee Atomic Electric Co.)

PRDC: Postponed Again

The Atomic Energy Commission has postponed again its scheduled hearing on Power Reactor Development Co's construction permit for a nuclear power plant at Monroe, Mich. The hearing now is slated for Jan. 8.

The postponement will enable PRDC to prepare its testimony for presentation in narrative form. This is the procedure used by the Federal Power Commission in which question-and-answer testimony is prepared in advance and placed in the record. Witnesses do not have to be present except for cross-examination or direct examination.

To Foil a Drought . . .

Union Electric Co has worked out a plan with the U. S. Corps of Army Engineers aimed at holding the drought-plagued Mississippi River at the –7.0 ft stage. Releasing water from dams on the upper Mississippi and Missouri Rivers will supply 9,000 second-feet more streamflow.

Inadequate rainfall has reduced water being released from upper Missouri dams since Oct. 15. Army Engineers estimated the river could fall to a record low level of –8.4 ft. Union Electric has trouble pumping circulating water to its steam plants at river stages below –6.0 ft. Union Electric engineers estimated steam plant production would have to be cut back 500,000 kw.

The present plan will enable the company to operate within the limits of the reserve and the amount that can be imported from neighboring utilities. (For details on the drought, see EW, Oct. 29, p 61.)

Utility Seizure Bill Killed

Ohio's House of Representatives has voted 110-0 against Gov Frank J. Lausche's utility seizure proposal, an outgrowth of a bitter labor-management feud which has resulted in a telephone blackout in Scioto County since Oct. 15. The bill would have permitted the state to seize and operate struck utility firms.

Under mounting public pressure, Gov Lausche sought a measure that would prohibit strikes and lockouts in public utilities, and make arbitration mandatory of utility labor-management disputes. A similar law, however, already has been declared invalid by the U. S. Supreme Court.

For Linemen: Shotguns

Connecticut Light & Power Co has equipped its line crews with weapons resembling sawed-off shotguns. The guns actually are Coast Guard line throwers which the company found highly useful during past flood emergencies. They shoot light nylon lines across swollen rivers, enabling men to pull across heavy cables. This sets the stage for pulling across heavier transmission lines, distribution wires, or temporary gas mains. CP&L said the line throwers probably will not be used except in emergencies.

Well, What Goes Up . . .

Electric alarm clocks failed to ring on time recently in the Michigan communities of Hudson, Pittsford, Waldron, and Frontier. Reason: At about 2 a.m., a large plastic balloon—apparently used for weather observations—settled on and shorted out a 44-kv Consumers Power Co line. Crewmen restored power in 20 min for the Hudson users, but it took them nearly four hours to restore service in the other affected communities.

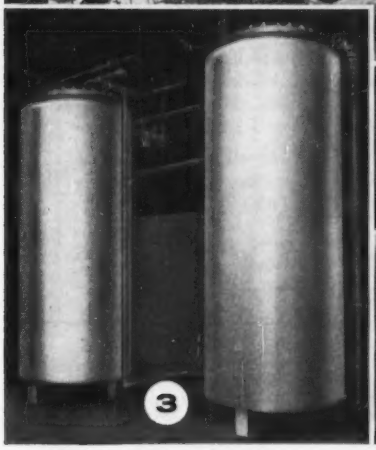
Now It's Up to the Court

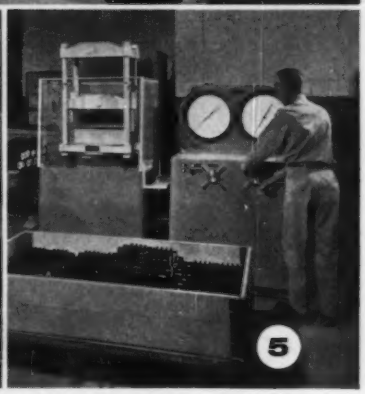
Preformed Line Products Corp claims in a suit filed in Cleveland, Ohio, that Fanner Manufacturing Co is infringing on its patents by making and selling guy grips and helically preformed elements on stranded line. Fanner replies that a 1944 agreement licenses it to make preformed armor rods patented by T. F. Peterson, now president of Preformed.

Peterson said Fanner made the rods for three years, but discontinued the line when he (Peterson) helped set up Preformed Line Products Co to make them, too. Preformed subsequently added tap armors, line guards, splice shunts, and patch rods to this equipment line—all products of Peterson's inventive brain.

Fanner resumed production of armor rods in 1953 and later launched production of a number of preformed patented products without the required licensing authority, Peterson asserts. He said Preformed warned Fanner, but the warnings went unheeded.

Fanner officials have declined comment pending the outcome of the litigation, but say they have operated within the framework of the 1944 agreement.





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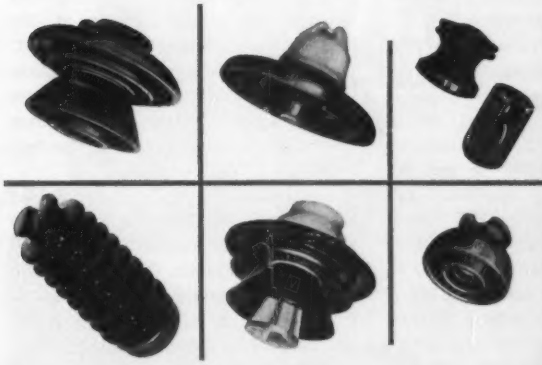
2. This impulse generator in VICTOR'S electrical laboratory, enables our engineers to perform steep front wave tests as well as standard impulse tests.
3. All processing water used by VICTOR is demineralized. VICTOR was the *first* in the industry to install water demineralizing equipment. A patent on our process is now pending.
4. To certify insulator soundness, VICTOR uses black light. Unfired insulators are sprayed with fluorescent material, then subjected to a near ultra-violet light source.
5. This hydraulic testing machine in VICTOR'S specialty porcelain department gives open cutouts and similar insulators a routine calculated transverse load before electrical test.



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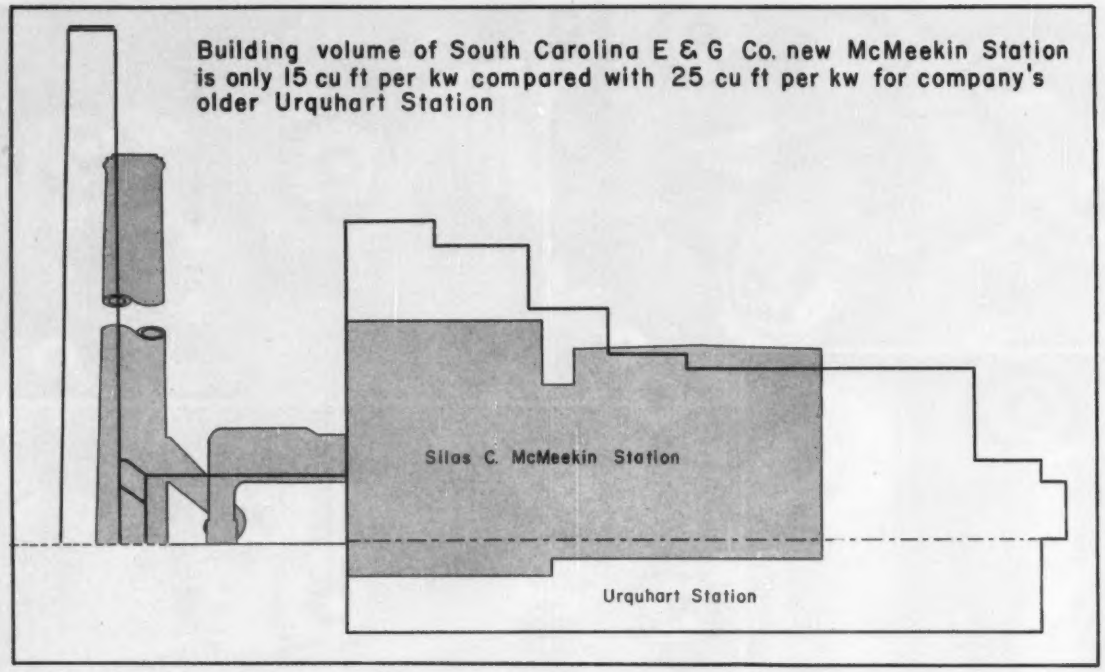

Building volume of South Carolina E & G Co. new McMeekin Station is only 15 cu ft per kw compared with 25 cu ft per kw for company's older Urquhart Station
Silas C. McMeekin Station
Urquhart Station

McMeekin Plant Costs Cut 7½%

GENERATION
Design

More efficient use of existing equipment, a good cooling water source, and optimum plant design reduce plant cost

G. L. DIBBLE, Manager, Production & Transmission, South Carolina Electric & Gas Co, Columbia, S. C.

A reduction in plant cost of $10 per kw is expected at South Carolina Electric & Gas Co's 250-Mw Silas C. McMeekin Plant as a result of optimum plant arrangement and the following features:

1. Reduced boiler height.
2. Axial flow from the turbine to condenser.
3. Condenser cooling water with an average yearly temperature of 50F.

The new plant, having an ultimate of four units, will have two 125-Mw units in operation by early 1958. It is to be located adjacent to the Saluda hydro plant, 15 miles west of Columbia, S. C.

In designing the plant, economy without sacrificing reliability was the key factor. Unknown fields were not explored, but every effort was made to make more efficient use of proven equipment.

First, a turbine was selected, having a nameplate of 125 Mw, 2,400 psi, 1,050F superheat, and 1,000F reheat. This would have required a conventional boiler about 40 ft square and 150 ft high, surrounded by air ducts and breeching. To operate and service this monster a minimum of five levels above the operating floor plus associated steel, grating, and stairs would have been necessary.

To reduce height and thus building cost, a controlled circulation boiler rated at 910,000 lb per hr, 2,775 psi, 1,050F superheat and 702,000 lb per hr, 1,000F reheat was designed. Overall height from ashpit to top of boiler steel is 90 ft, and the 52,000-cu-ft furnace is 41 ft wide and 21 ft deep with a division wall. Firing is by 16 adjustable tangential burners, supplied with coal from four bowl mills having separate feeders.

Three canned-motor boiler pumps will be installed for positive water circulation, any two of which are capable of handling full load. This type of pump eliminates problems encountered with seals and injection water.

The four-section superheater with interstage desuperheaters has a surface of 75,000 sq ft. The two-section reheater has desuperheaters at the inlet and a surface of 16,000 sq ft. Use of both radiant and convection superheating and reheating surfaces maintains full steam temperatures over the operating range of the turbine.

Economizer is of the horizontal-fin tube type with 39,000 sq ft. Two regenerative air heaters, of 176,000 sq ft total, reduce the temperature of the gas leaving the economizer from 640F, at full rating, to 268F, uncorrected. Combustion-air temperature is raised from 80F to 555F.

(*Continued on page* 24)

Adapted from a paper presented at the Southeastern Electric Exchange Engineering & Operation Section meeting, held in Augusta, Ga.

Now...Wagner Form W Transformers are smaller, lighter in weight

Even before the newest trend to lighter, shorter transformers, Wagner's Form W construction resulted in small-size, lightweight distribution transformers.

Today, an improved new design makes possible a new Wagner Distribution Transformer of Form W design that is up to 17% lighter, 18% shorter, and requires less oil than any *previous* Wagner Pole Type Transformer.

For you, this means greater ease of handling, less storage space required. *It also means you can save money by putting greater transformer capacity on already existing structures.*

They offer you these proven features

1 SHUR-SEAL COVER

Wagner's exclusive Shur-Seal clamping ring keeps transformer sealed air-tight... no atmospheric moisture or dust particles can get inside—no loss of oil can occur at any time.

2 SAFETY-DESIGNED HV SIDEWALL BUSHING

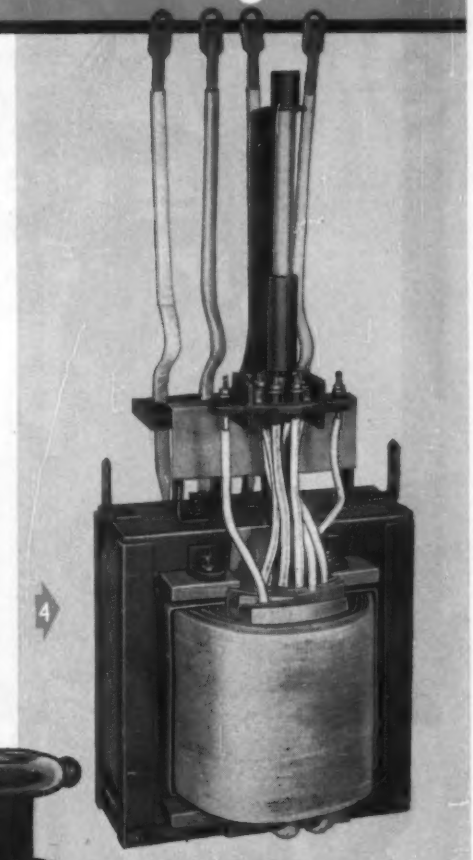
For use with either copper or aluminum conductor. Key-locked to prevent rotation. Conductor is simply pushed into connector and is tightened with a few turns of the insulated knob. Faster—easier—safer.

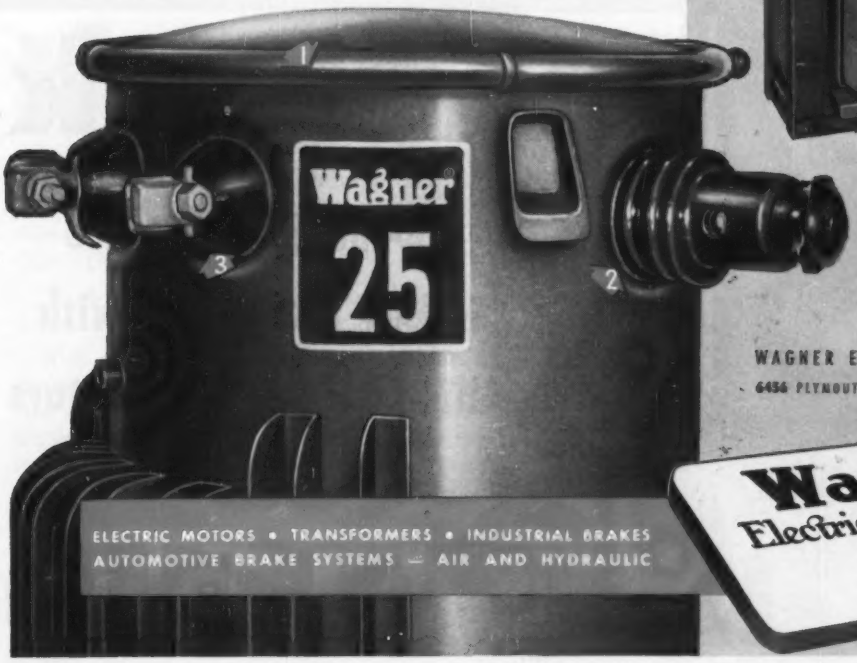
3 KEY LOCKED LOW VOLTAGE BUSHING

This bushing key-locks to prevent rotation... porcelain is keyed to the tank and metal stud is keyed to the porcelain. There can be no loose internal connections to cause shorts.

4 FORM W ELEMENTS

The new Form W core is of cold-rolled oriented grain transformer steel. Thermo-setting insulation bonds coil element into a solid, homogenous unit, which is braced to prevent any possibility of shifting.





These new Wagner Pole-type Distribution Transformers are available in ratings from 15 through 167 kva.

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On-the-Spot Service is Key to Savings with Allis-Chalmers Regulators

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All it takes is a 2-man crew and a pickup truck to handle 99% of the service requirements of Allis-Chalmers regulators. The reason — UNIT CONSTRUCTION.

"Unit Construction" eliminates piecemeal inspection — a long time-consuming process.

With Allis-Chalmers regulators, a 2-man crew arrives in a pickup truck, sets up the hydraulic jack and, in a matter of a few minutes, has lifted the regulator far enough out of the tank for inspection. There's no need for large crews and expensive equipment to move and untank the regulator.

Estimated hourly cost of crews is about $9 for a 2-man crew and about $18 for a 4-man crew. A saving of at least $9/hour. The picture at left tells at a glance the story of easy maintenance with Allis-Chalmers unit construction.

This is only one point of comparison. For the complete story, call your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

CHALMERS

A-C ALLIS-CHALMERS

A-5142

McMeeckin Plant Costs

(*Continued from page* 20)

Predicted efficiency of the boiler is 89.55% at rated output.

Reduced building wall costs and better ventilation are achieved by placing hottest parts of the boiler outside. Therefore, superheaters, economizer section, air heaters, and fans are not enclosed. This arrangement minimizes auxiliary elevations, air ducts, and breeching. Locating connections for main steam and hot reheat lines at the lowest possible elevation saves 135 ft of piping.

Further reduction in building volume was obtained from a detailed study of tandem machines and cross-compound axial-exhaust machines. Results proved that for the axial-exhaust machine:

1. The turbine foundation was less costly, condenser-room pit depth was reduced, and crane span was shortened.

2. These savings more than offset increased machine cost.

3. Heat rate would be lower.

The cross-compound arrangement consists of a 3,600-rpm high-pressure and reheat turbine and a 1,800-rpm low-pressure turbine, close coupled on the same foundation. Axial exhaust in the low-pressure turbine is expected to provide a maximum gain of 0.6%, depending on length of last stage buckets and design of exhaust hood at optiumum condenser flow. Gain is reduced at flows greater or less than optimum.

By diffusing the kinetic energy in the steam, the exhaust hood produces a static pressure at the exit of the last stage buckets which is lower than that in the condenser. In addition to partially regaining the kinetic energy in the steam, the coaxial arrangement of the exhaust and condenser reduce losses associated with conventional elbow exhaust hoods.

To obtain these benefits, condenser inlet diffuser, and turbine exhaust diffuser must be carefully designed for optimum performance. Models of both were tested to solve the following problems:

1. Non-uniformity of stream velocity distribtuion at the exit from the turbine.

2. Variations of swirling components of steam velocity at different radii and turbine loads.

3. Geometry of struts supporting the bearing housing exhaust hood.

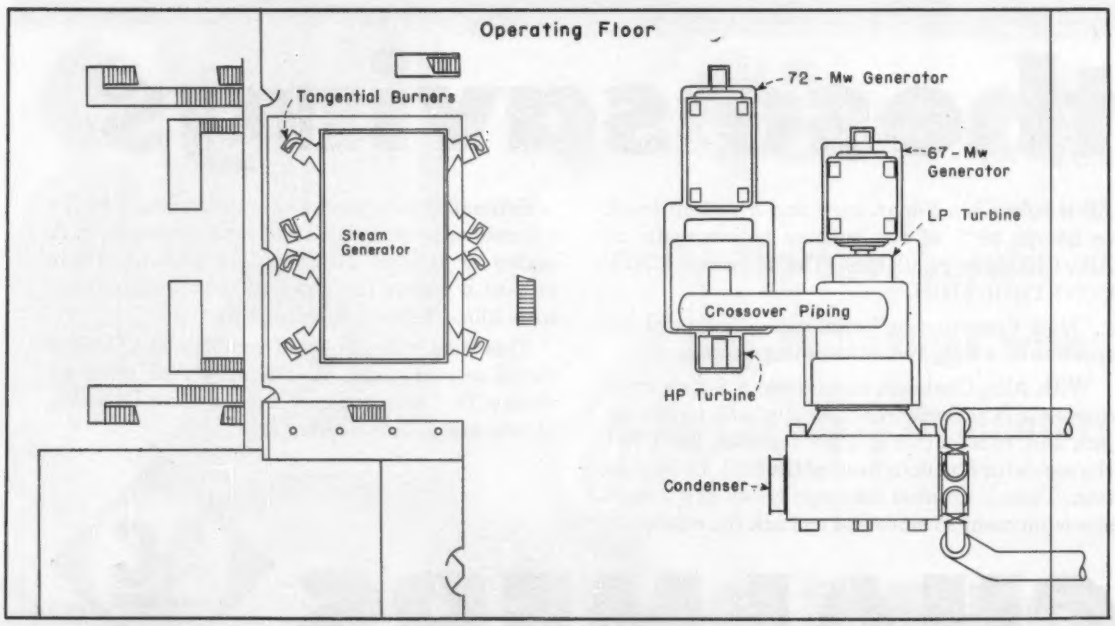
4. Space limitations dictated by economical plant layout.

Connecting a generator and condenser to opposite ends of a turbine leaves no place for the normal end standard. So the bearing, governors, controls, and supervisory instrument detectors will be mounted in a cylindrical enclosure in the center of the exhaust-steam path. This enclosure is of double-wall construction with the intermediate space vented to atmosphere to prevent oil from leaking into the condenser. Both bearing and enclosure are supported by hollow radial struts which provide space for wiring, piping, and control rods.

Outer part of the exhaust hood structure is a cone of steel plate with external stiffening ribs. Welded to these ribs are longitudinal feet for supporting the hood on a foundation. The condenser is supported on vertical flexible columns at the center line of the turbine axis and flanges directly to the turbine hood. Mounted on the condenser are turbine blowout diaphrams.

Condenser cooling water is obtained from and returned to the lake behind the dam by tapping the surge tank risers of two hydro-machines' penstocks. By use of cross-over valving and free discharge into the tailrace, either penstock can be taken out of service for maintenance. Because the condenser is 135 ft below full lake elevation, piping and condenser water box are designed for

(*Continued on page* 26)



AXIAL EXHAUST FLOW from lowpressure turbine is expected to provide about 0.6% gain in this cross-compound arrangement. Also turbine foundation is less costly, condenser-room pit depth reduced, and the gantry crane span shortened

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Connectors may look alike
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BLACKBURN CONNECTORS OUT-PERFORM THEM ALL

Because They Are...

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- Made of high strength duronze, a silicon bronze alloy stronger than structural steel.
- Machine cut threads, *CFC treated, provides more thread engagement —reduces friction and increases thread efficiency. *Chemical Friction Control.
- Rigid inspection of each production operation assures uniformly good connectors.

BETTER ELECTRICALLY

- High clamping force—the result of greater thread efficiency breaks down oxide on the conductor improving conductivity.
- Higher initial conductivity, actually greater than an equal length of conductor is maintained permanently.

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- Selection of proper high-strength, corrosion-resistant materials—plus precision workmanship and inspection—means Blackburn connectors may be used over and over.

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AVAILABLE AT ELECTRICAL WHOLESALERS EVERYWHERE

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McMeekin Plant Costs

(*Continued from page* 24)

a static pressure of 125 psi.

Use of lake water provides a coolant having an observed temperature variation of less than 10 deg from an average of 50F. Further economy is realized by eliminating the conventional intake structure, screen house, and intake and discharge tunnels.

Boiler-feed pumps presented a problem of power requirements, mental operating hazards, and economics. The company selected as most economical, three half-capacity 5,000-rpm pumps with step-up gears, magnetic coupling, and 1,800-rpm 2,500-hp electric motors. Three-element feedwater control is being provided as well as steam temperature and electronic combustion control. Magnetic couplings will be installed on the two forced-draft and two inducted-draft fans.

As for electrical aspects of the station, the high-pressure turbine drives a 96-Mva 85% pf generator, and the low-pressure turbine drives a 76.8-Mva 85% pf generator. Both generators are separately excited and solidly connected to a 3-phase 175-Mva 13.8—115-kv forced-oil-water-cooled transformer.

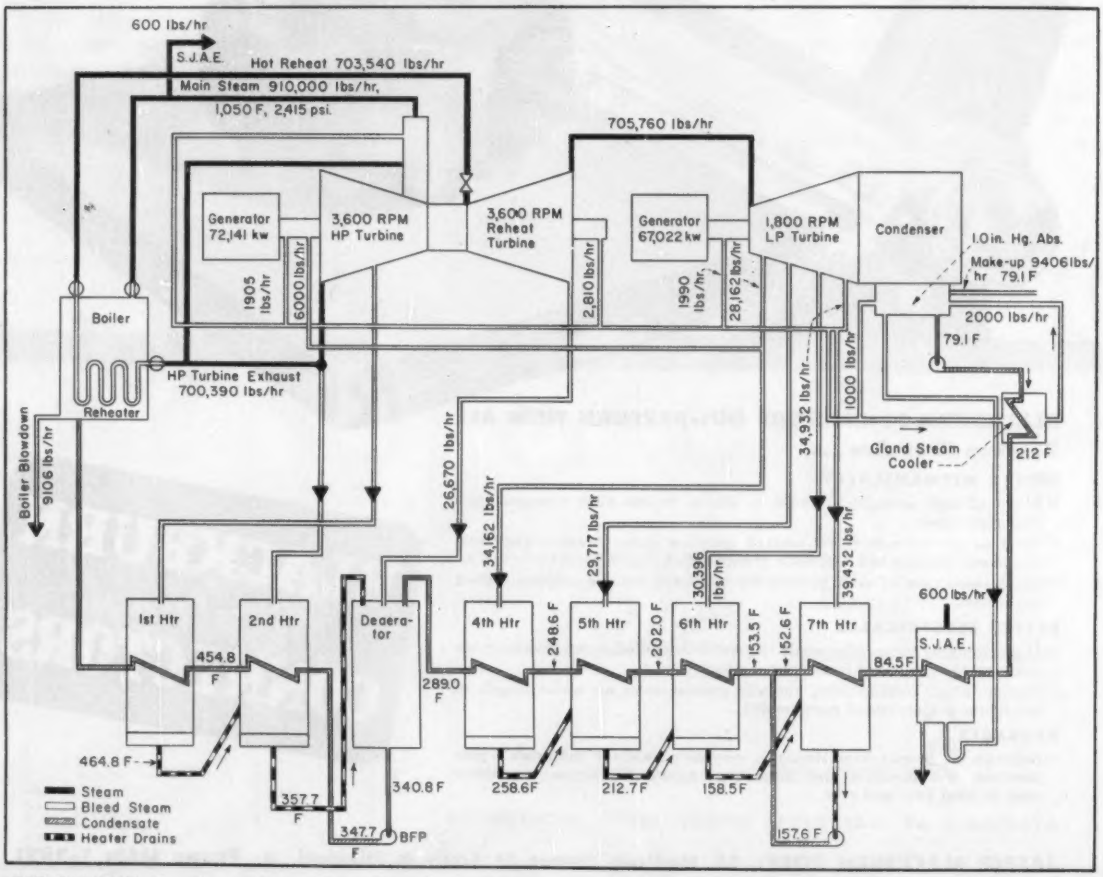
An oil circuit breaker connects the high side of the transformer to the existing hydro-plant substation bus.

Essential equipment will be controlled by one operator per unit in a central control room where automatic logging equipment will be installed to record all essential data. Two additional shift personnel will probably be needed for the two units to make inspections and minor adjustments.

Plant equipment was arranged for maximum use and to localize operating areas for two units. Bunkers for the second unit will be alongside those for the first and between the boilers. Thus, feeders can be located on the operating floor close together. Also, mills are grouped on the lowest elevation, and boiler burners located on the operating floor eliminate additional platform steel and grating.

Such coordination of operating and physical requirements reduced building volume substantially, compared with the last 100-Mw unit installed at Urquhart Station. If the first McMeekin boiler was totally enclosed, the building volume would be 15 cu ft per kw as against 25 cu ft per kw at Urquart although areas at the operating floors are identical. This saved 495 tons of building steel per unit.

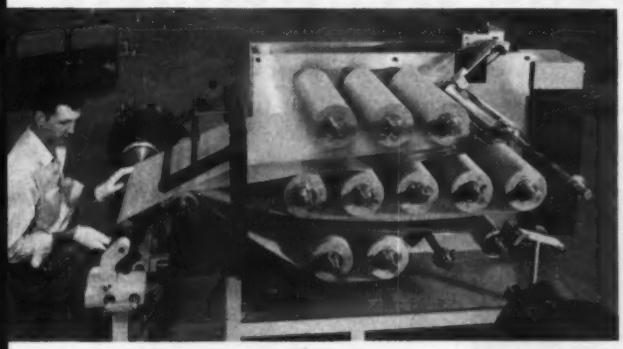
Cost of the first two units at McMeekin is expected to be $125 per kw of capability—about $10 less than the company's conventional design.



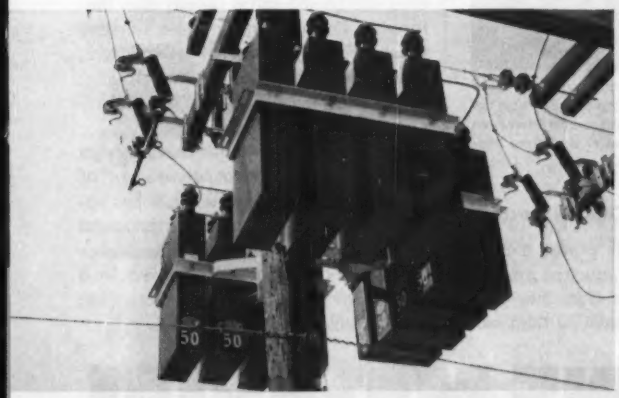
HEAT BALANCE for the station utilizes four low-pressure heaters, one deaerating heater, and two high-pressure heaters. Load split on the cross-compound unit is almost equal with 72 Mw on high speed shaft and 67 on other shaft

Sangamo's new $5,000,000 factory in Pickens, South Carolina supplements the Illinois facilities for capacitor production.

New Sangamo Plant speeds production of SANGAMO POWER CAPACITORS



Capacitor sections of kraft paper and pure aluminum foil are wound under controlled atmospheric conditions.



This cluster mount of 12 Sangamo 50 Kvar Capacitors is part of a bank installed at a Texas substation.

Now, Sangamo's expansion program provides another modern plant for increased production of Sangamo Power Capacitors to help meet the demand created by the nation's growing power load.

Sangamo Capacitors are built to power engineers' specifications. Step-by-step quality control of raw materials and fabrication and rigid inspection—all combine to produce the highest quality capacitors.

They're available in 15, 25 and 50 Kvar units, in all primary voltage ratings and in factory-assembled and wired Auto Var equipment for pole-type installation. Auto Var equipment, with or without switches, can be furnished for standard in-line or multi-row mounting, or to meet special installation requirements.

Sangamo also manufactures Time Switches and Lincolntrols for automatic capacitor control as a function of time, volts, amperes, watts, or vars, or as combinations of these functions.

Ask your Sangamo Representative, or write us for full information today.

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ELECTRIC COMPANY
Springfield, Illinois

PC56-6

L-M's Round-Wound transformers provide more capacity for heavier short-time overload without sacrifice in transformer life. Because L-M's obround design is lighter, smaller, and has less bending moment than round tank design, three 167's can be hung on a two-pole structure in place of three 100 kva transformers of older design.

For Heavier Commercial Loading

Why L-M Round-Wound® Transformers

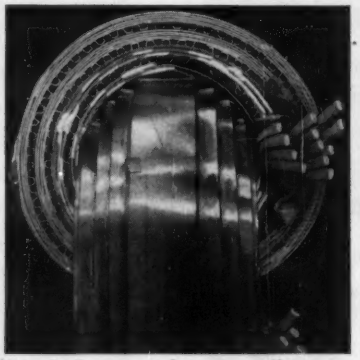
Core-type construction with cruciform cross-section core and round coils provides the most efficient design for lower hot-spot gradient, greater capacity for short-time overload.

By **ROBERT P. THOMPSON**
Manager of Engineering
Transformers
Line Material Company

One of the primary factors that limit the overload capacity of a transformer is the efficiency with which heat from the coils can be dissipated into the transformer oil. Particular care was taken, therefore, in the design of L-M Round-Wound transformers, to assure greatest exposure of coil surface area to cooling oil, and least obstruction to oil circulation.

Cruciform Cross-Section Core

The core is wound of a continuous strip of oriented steel, of varying widths, to form a core of nearly round cruciform cross section. The cruciform cross section of the core provides natural oil passages for cooling between core and coils.



Natural oil passages between cruciform core and round coil help to dissipate the heat from the coils more rapidly. In addition, ducts between windings and between layers in most sizes provide additional oil circulation.

Round Coils and Cooling Ducts

L-M's long round coils expose a relatively large and highly efficient area to cooling oil. Because of this, they provide greater overload capacity than rectangular coil types. In addition, ducts are provided for oil passages between windings and between layers in most sizes, giving exceptionally uniform cooling for the coils.

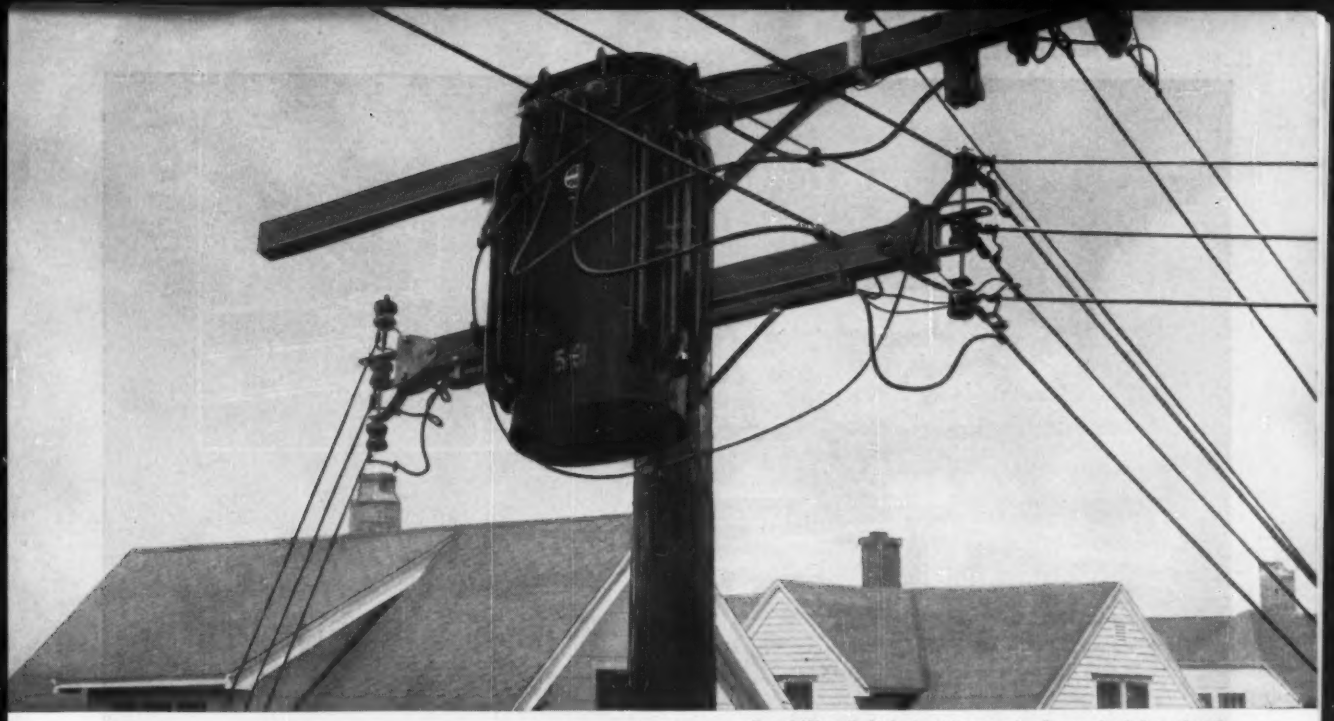
Core-Type Construction

In comparison with shell-type construction, L-M's core-type Round-Wound transformer has greater outer coil surface exposed to cooling oil; therefore coils are cooled more rapidly and uniformly. The cooling surfaces of shell types are partly blanketed by core steel; oil circulation is more obstructed.

Lower Hot-Spot Temperature, Higher Overload Capacity

Because L-M's Round-Wound design provides more efficient dissipation of heat from the coils to the oil, it has appreciably lower hot-spot temperatures during overload. This permits higher short-time overload, or longer overload periods, or greatly increased over-all life of the transformer.

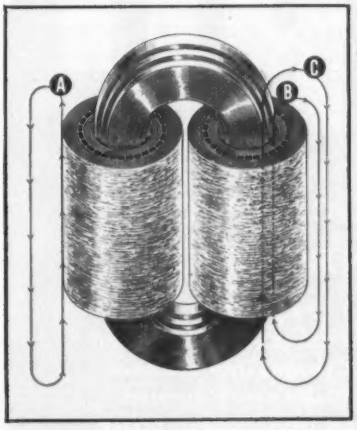
LINE MATERIAL
A McGRAW ELECTRIC COMPANY DIVISION



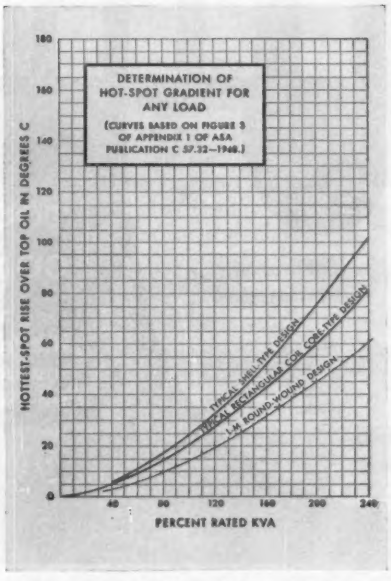
Round-Wound's high short-time overload capacity helps solve the more difficult *summer* overload problems in residential areas. The efficient cooling system in L-M transformers keeps hot-spot temperatures lower under high short-time overloads, increasing the capacity for overload and reducing the possibility of insulation damage.

For Heavier Residential Loading

Have Higher Overload Capacity



Because L-M transformers expose large, unobstructed areas to cooling oil on the outside of the coil (A), between core and coil (B), and between windings and layers (C), heat is dissipated into oil more rapidly and uniformly during overloads.



The higher the gradient at rated load, the more rapid is the rate of increase in the gradient with overload. Note that L-M's Round-Wound transformer, with a *lower* temperature differential (gradient) between hot-spot and top oil at rated load, has a greater capacity for overload.

Five Reasons Why More Customers Are Selecting L-M Round-Wound Transformers

1. Higher Uniform Impulse Level: Round coils are *wound* into shape. Therefore insulation is not damaged by malleting into rectangular shape. Coils have longer creepage distance between windings and between leads.

2. Higher Short-Circuit Strength: Round coils are not stressed out of shape under high radial short-circuit forces. Strong steel frame, heavy clamping bolts, sturdy maple blocks and varnished coils prevent axial movement.

3. Higher Short-Time Overload Capacity: Round coils and the cruciform cross-section core expose large surfaces to cooling oil. The result is relatively low hot-spot temperatures, which add considerably to high short-time overload capacity.

4. Balanced Performance: The core is a continuous wound strip of oriented steel. Coils are wound directly onto this core. Since the core is not cut, unwound, or disturbed in any way after annealing, there are no air gaps to break up the flux path. This results in low exciting current and core loss.

The wound-core, round-coil design permits fewer winding turns and smaller turn diameter. This results in low impedance, and provides better regulation at all power factors.

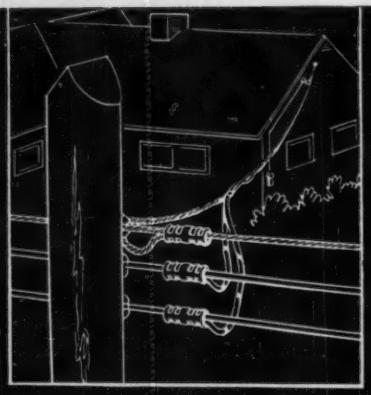
5. Additional Capacity on Pole: L-M's new obround tank design makes the unit smaller and lighter, with shorter moment arm from the pole. This combination reduces the bending moment on the pole and crossarms, and thus greatly increases the potential capacity of existing transformer structures.

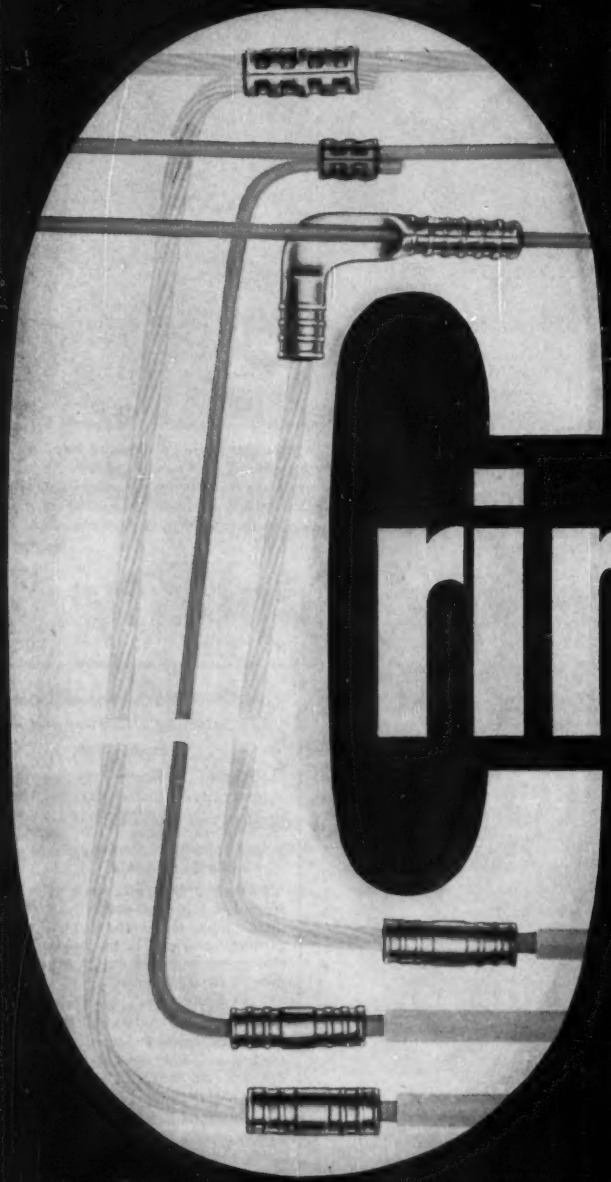
Get Complete Information

Ask your L-M Field Engineer for complete information on L-M's Round-Wound design, and bulletins. Or write Mr. Thompson at Line Material Company, Transformer Division, Zanesville, Ohio.

Transformers

Do the job better!





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Farm Competition Gets Rougher

Increased mechanization, liquid petroleum, and gasoline inroads bring service, education needs into sharper focus

Power suppliers must keep pace with growing demands, as farmers come closer to filling the roles of industrialists.

This consensus and examples of how the risk is being met, were highlights in the recent American Institute of Electrical Engineers conference on farm electrification at Memphis, Tenn.

To bridge the wiring problem, said Glen Rowell, Fire Underwriters Inspection Bureau, utilities have to combat "the root of the evil"—shopping for low-price installations during the lean 30's. Three show farms near Minneapolis are a case in point. For one, a contractor donated services worth $1,700. After touring the place, 49 nearby farmers made wiring and equipment changes.

Urges Show Farms

Rowell's suggestion for effective work on the wiring bottleneck: "Not only should utilities promote show farms, but they should set up a committee to serve farmers. This body would have authority to review farmers' problems. It would be a clearing house to insure a dollar's worth of electrical installation for a dollar spent."

He cited a Minnesota co-op, over half of whose 6,000 members paid $5 each for a safety survey of individual farms. The results were turned over to contractors by a clearing committee.

Gives Irrigation Program

An irrigation load development program was outlined by A. E. Autry, who delivered a paper by H. O. Roberts Jr, Central Power & Light Co. The highlights:

- Individual customer assistance. By providing pump testing, water analyzing, and cost planning the Texas utility wins friends by making most effective use of available water at lowest cost.
- Group educational activities. Usually held with county agents, soil conservation service or both, often take form at farmer meetings. Conducted where good irrigation practice or demonstration is emphasized, the sessions last three to six hours. They cover three to five topics, such as well construction, development and testing; pump selection; surface and sprinkler irrigation; system design; water application rates and time, crop requirements; irrigation cost and management; and, financing. CP&L men appear on programs of civic clubs, chambers of commerce and other associations concerned with water resource conservation.
- Engineering help to well drillers and pump dealers. Impartial contacts and regard for confidential information boost pump load while increasing sales.

TVA Activity Described

"Teaching the teachers" and sounding out farmers about pressure water systems are keystones of a Tennessee Valley Administration education program that brought 1,849 water system installations in two years. This figure is based on incomplete data.

Described by William R. Walker, TVA, the program included a Mississippi postcard survey of farmers which asked whether they wanted information or a personal call about their water systems. Some 8,700 were returned from a mailing of 23,908. Meanwhile, workshops for county sanitarians and agents, health officials, vocational agricultural teachers, and power distributors' men detailed basic pump information by displays, demonstrations and talks.

Poultry Goes Big Time

Poultry has gone "big time." It is the third largest income-producing item on the farm, said Paul Benbow, James Mfg Co. Since 1950, nearly 900,000 poultry producers have disappeared from the U. S. farming scene. But mechanization has accounted for increases in size of flocks, especially those over 3,000 birds, he said. Equipment involved provides automatic ventilation, mechanical feeding and cleaning, pressure watering, bulk feeding, and mechanical egg gathering. The result: With no more labor than caring for 250 birds 25 years ago, today's poultryman cares for 10,000 birds. This means good utility load.

"Hold-closed" line sectionalizing on distribution systems improves service continuity and reduces operating expense, said George G. Auer, General Electric Co.

Cuts Outages

For example, automatic reclosers in a circuit with 0.9 transient fault ratio brought a 67% outage reduction with two instantaneous openings and reclosings. For permanent faults, fuse cutouts minimize outage, he said. The hold-closed protection scheme offers economic benefits and eliminates the cold load pick-up problem.

"All safety problems are not solved by grounding," said O. K. Coleman, Duncan Electric Co. "Insulation or isolation may sometimes serve the better purpose. But, if and when grounding is done, remember the principle 'avoid difference of potential'—tie all those things together that are grounded."

Sees 3-phase for Farms

Three-phase service is the answer to farmers' switch to other power sources, according to Everett Dill, East River Corp, and James Kiley, Sioux Valley Empire Electric Association Inc. Multiphasing projections reveal that 3-phase loads may be served at lower rates than now anticipated. With more attractive rates, many rural consumers will reach the point where 3-phase becomes economically justifiable.

"A lot of farms have electricity in limited quantity," warned Nolan Mitchell, Aerovent Fan & Equipment Inc. "This year, 71% of manufacturers' high capacity (15-hp and above) drying units were shipped with power take-off units. And 41% of all heater drying equipment went out with power take-offs."

According to W. J. Ridout, Jr, this limited service problem is the most serious one facing farm electrification today. Ridout, editor of Electricity on the Farm, summarized the meeting by saying, "We can't afford to provide only limited service. Agricultural production will not be rationed for lack of power because—and remember this—gasoline and liquid-petroleum gas are abundant."

PCEA Hears Accounting Talks

Services section meets with PCGA group to discuss cost detailing, purchasing, and automation in the processing

Functional accounting can give management a constant and accurate earnings forecast, the administrative services section of the Pacific Coast Electrical Association was told at its Nov. 14-15 meeting in Santa Barbara, Calif. The group met jointly with the Pacific Coast Gas Association's accounting section.

Such accounting, said P. B. Sharrott, has provided management at Southern California Edison Co with accurate information in a shorter time and at less clerical expense. The functions, he said, are company-established subaccounts of PUC and FPC accounts affected and cover particular operations selected by departments as significant in the control of their expenditures. Use of the functions simplifies distribution of expenses on source documents and establishes better cost detail.

An ordering guide procedure has been inaugurated at Pacific Gas & Electric Co to relieve the purchasing division of paper work in the purchase of routine operating and maintenance materials and supplies, J. P. Schaefer told the meeting. The procedure delegates limited purchasing functions and authority to substores ordering offices, whose personnel process and place orders directly with vendors through ordering instruction sheets.

R. B. Marlatt, Southern California Edison, advocated the rotation of buyers' duties and accountability as a means of making the purchasing department more flexible and increasing overall departmental knowledge. Such rotation, he said, tends to build department morale. It also provides a backlog of personnel for absences and rush periods.

Automatic machines will prepare a large volume of purchase documents, said R. P. Benton, Pacific Gas & Electric. The IBM random-access memory machine, he said, permits the use of pre-punched, interpreted cards as substore material requests. Purchase orders could be prepared on pre-printed, pre-signed forms by such a unit connected to a tabulating machine.

The traffic function belongs to the purchasing department of a utility, said R. E. Taylor, Southern California Gas Co. He pointed out that through the closer working relationship, the traffic section could advise buyers on transportation costs and schedules and could deal directly with shippers.

J. S. Green, Southern California Gas, pointed out that accountants express greater dissatisfaction over lack of advancement opportunities and the handling of promotions than any other group.

"We must consider seriously," he said, "the risks of paying too little attention to human relation skills in the development of accounting employees who may become supervisors."

For better employee relations, a supervisor should accept individual differences among people, have all pertinent facts before acting, be a good listener, delegate responsibility, and let each employee know how he rates for a given job, said L. W. Crosby, Southern California Edison.

Purchasing must be located close to top management departmentally to broaden its profit-making activity, and its authority to purchase materials and services must be defined, said L. Jantz, California Electric Power Co. Buyers, he added, should be freed from much service work to give proper attention to the department's profit-making side.

Douglas PUD Embroiled in Upstream Benefits Tangle

Reasoning behind the Douglas County PUD's request for the Circuit Court of Appeals to review FPC action in licensing construction of Chelan County PUD's Rocky Reach Dam on the Columbia River is revealed in a preliminary engineering report on the $110 million, 414,000 kw, Wells hydroelectric project proposed for an upstream site by the Douglas PUD.

The FPC has granted Douglas 22,500 kw of power from Rocky Reach as compensation for encroachment of the Rocky Reach pool upon the Wells site. The Douglas County PUD contends it should have 30,000 kw, since it in turn would have to transfer 30,000 kw to the Corps of Engineers for encroachment on Chief Joseph Dam.

The proposed Wells Dam would be 28 miles below Chief Joseph Dam.

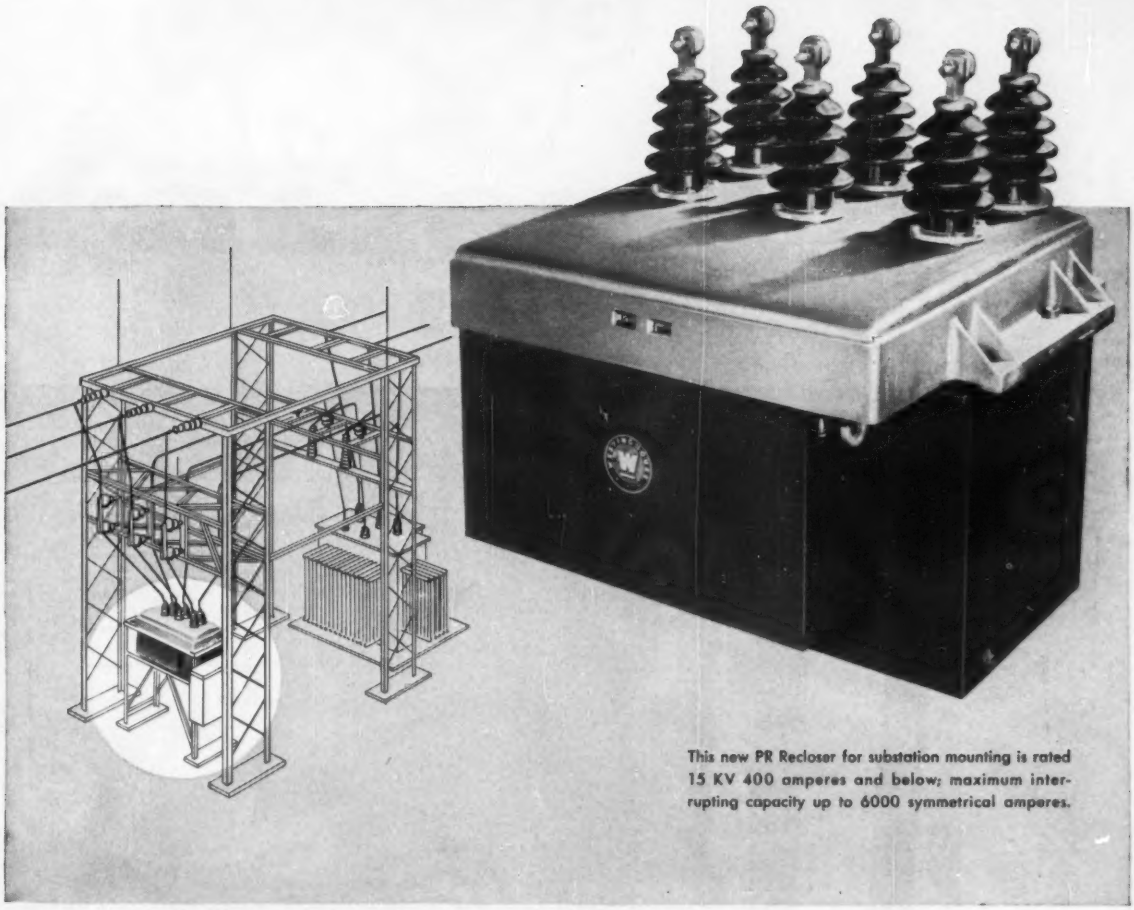
With 30,000 kw from Rocky Reach, cost of the Wells power would be only slightly more than 2½ mills, according to the preliminary engineering report prepared by Kaiser Engineers. If the present FPC provision in the Rocky Reach license holds, the power figure would rise to about 2¾ mills. This would increase power costs $350,000 annually and might mean the loss of the aluminum plant Kaiser proposes to build in Douglas County, said Frank Stewart, the PUD's consultant.

Installed per kilowatt cost of the project would be $262, as compared to $287 for Priest Rapids Dam now under construction downstream by the Grant County PUD, and an estimated $300 for Rocky Reach, the report indicates.

Douglas PUD will fall into a compensation tangle, itself, when the 775-ft elevation pool, recommended for Wells, backs water to the Chief Joseph tailrace. Compensation must be worked out for power loss at Chief Joseph caused by the Wells project.

George Hamilton, president of the Douglas PUD, indicated that his group will reserve its decision on constructing Wells Dam until its compensation appeal is heard by the Ninth Circuit Court.

Douglas PUD agreed, in the meantime, to provide electric power for construction of Chelan's Rocky Reach project. Engineers building Rocky Reach will set up their construction area on the Douglas side of the river, and electric service from Douglas PUD will overcome a transmission problem.



This new PR Recloser for substation mounting is rated 15 KV 400 amperes and below; maximum interrupting capacity up to 6000 symmetrical amperes.

NEW automatic recloser

. . . inexpensive protection for growing substation loads

Here's a packaged bargain for your distribution system in the substation or out on the line.

First of all, the new PR recloser provides 2-3 cycle, high-speed opening, and fast, efficient power restoration. This means, too, much greater protection than ever before against line burn-down. It's all completely automatic . . . real assurance of service continuity on your system.

Second, the package unit is especially built for reduced installation and operating costs . . . shipped frame mounted, wired, tested, ready to be put on the line.

Third, many circuit breaker features are built into the new PR recloser . . . proved condenser bushings, multi-ratio bushing current transformers for ground trip and load indicating metering and other relay functions, dependable motor reclosing, in addition to the time-proved Westinghouse De-ion® interrupters.

Fourth, to ease operating chores, the Westinghouse recloser design provides two separate tanks . . . one, an oil tank, housing the interrupters; the other, a relay and mechanism tank. No scrambling in oil tank with recloser control devices . . . a tank lifter offers easy oil and contact inspection. An accessory cabinet is available with ammeters, control protection and switches . . . demand meters separately trough mounted provide means of load indication and integration.

There's more to the story, so call your Westinghouse representative, or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna.

J-60890

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*WHERE **BIG** THINGS ARE HAPPENING **TODAY!***

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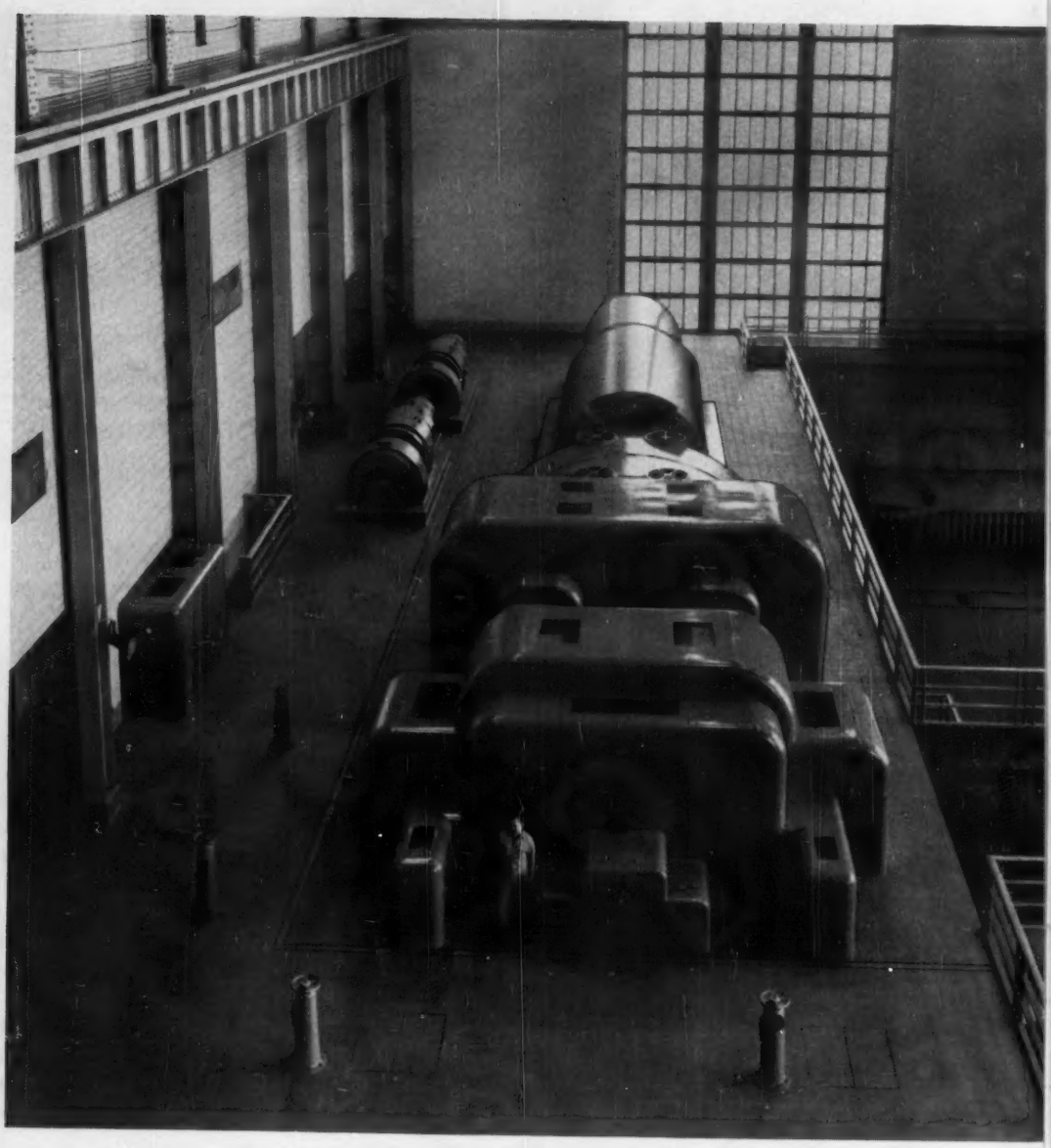


efficiency!

New Westinghouse unit
at Burlington Generating Station
Public Service Electric and Gas Company
sets record at 9090 Btu / kwhr

In accordance with the rating procedure of the Federal Power Commission, this Westinghouse 200,000-kw turbine-generator proved to be the most efficient unit in the country during its first six months of operation. Its 9090 heat rate was 20 Btu/kwhr lower than the best station rate.

It is a tandem-compound, triple-exhaust, 3600-rpm machine, designed to operate at steam conditions generally above those in common service today: 2350 psig, 1100° F throttle temperature, and 1050° F reheat temperature. The generator is hydrogen cooled, with the rotor cooled by hydrogen flowing through hollow field conductors. J-50592

YOU CAN BE SURE...IF IT'S Westinghouse®

NEWS ABOUT PEOPLE

PP&L Advances Busby

Jack K. Busby has been appointed executive vice president and elected a director of Pennsylvania Power & Light Co, it was announced following board of directors' meeting late last month in Allentown, Pa.

He started with Pennsylvania Power & Light Co in December 1951 as a general counsel and became vice president and general counsel as of June 1, 1954.

Before that Busby had been associated with the New York law firm of Simpson Thacher & Bartlett since his graduation from Princeton University magna cum laude and Yale University law school.

His duties with the law firm were interrupted by a four-year term in the U. S. Navy during World War II.

JACK K. BUSBY

Hoover Is Designated As VP

Pacific Power & Light Co has elected Veryl Hoover to the post of vice president.

He assumes the duties of retiring vice president and manager of the Wyoming Division, W. D. Johnston, who is retiring after 36 years of service in the utility field. Johnston will continue, however, as a director of the company and an advisor in the Wyoming Division.

A veteran of 29 years service with Pacific Power & Light Co and Mountain States, Hoover joined the predecessor company in 1927 as an addressograph operator. In a series of promotions from 1929, he became assistant to the division manager at Albany, local manager at Nelscott, and then division manager for Northern Idaho.

After the PP&L merger he was promoted to assistant general manager and finally in 1955 was assigned to Casper as assistant to Johnston.

VERYL HOOVER

Fiss Made A-Group Engineer

Carolinas Virginia Nuclear Power Associates, Inc, has named E. C. Fiss as engineering director of their project to build a proposed nuclear power plant serving the Carolinas and Virginia.

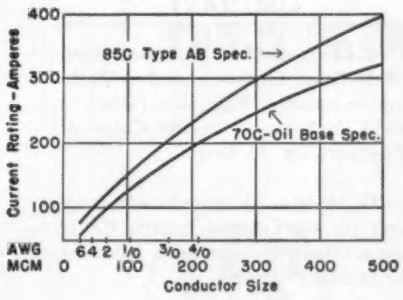
Fiss, at present, is a director of nuclear development for Duke Power Co. He has spent the last three years in nuclear power work, one of them on loan to General Electric. Fiss joined Duke Power in 1939 while working toward his doctorate at the University of Missouri. He became chief chemist of the company in 1946 and chief of chemical engineering in 1953.

Also named were members of the steering committee: O. J. Miller, executive vice president, Duke Power; H. B. Robinson, vice president-general manager, Carolina P&L; Miles Cary, vice president, Virginia E&P; and F. R. McMeekin, vice president, South Carolina E&G.

E. C. FISS

Greater current-carrying capacity of Type AB butyl high-voltage cable helps users cut costs, use new or existing facilities more efficiently.

Cable that takes the squeeze out of crowded conduits



Now you can obtain the same amount of current with a smaller cable... or more current with the same size cable—with Anaconda's Type AB butyl high-voltage insulation.

For Anaconda Type AB butyl-insulated cable is recommended for operation at 85C *operating temperature.* Industry specifications recommend 70C for oil-base insulations. Thus, as the curves on the chart show, Type AB delivers 22% more current-carrying capacity . . . and more amps per dollar.

New Engineering Bulletin EB-27 gives you full details on performance of Type AB insulation in 15 Industry Specification Tests. Ask the Man from Anaconda for your copy. Or write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

50295 Rev.

SEE THE MAN FROM ANACONDA®

—pioneer in BUTYL INSULATION

COMFORT A. ADAMS

Adams Awarded AIEE's Edison Medal

Winner of American Institute of Electrical Engineer's 1956 Edison Medal is Comfort A. Adams, Harvard professor emeritus, electrical engineer, and the oldest living past president of AIEE.

Adams, who will receive the award during the Institute's Winter General Meeting, Jan. 21-25, was honored "for pioneering achievements in the development of ac electric machines . . . for vision and initiative in formation of an engineering standards organization . . . and for eminence as an educator and consulting engineer.

An electrical engineering graduate of Case School of Applied Science, Adams holds honorary doctorates in engineering from Case and Lehigh University. Adams, who joined AIEE in 1894, served as its president in 1918-19 and received the Institute's Lamme Medal in 1940. He was Lawrence Professor of Engineering at Harvard from 1911 until 1936, when he retired.

PERSONAL BRIEFS

Harry S. Peterson, formerly publicity director of Black Hills Power & Light Co, has been upped to director of personnel and public relations.

West Penn Power Co has advanced **Russell E. Caywood** from manager of rates to assistant comptroller-manager of rates and statistics. The company also promoted **James F. Wolfe** to Bethel district operating superintendent, **Albert W. Washk** to Washington district operating superintendent, **Clair C. Elder** to Washington operating foreman and **Laurence C. Burns** to general foreman in Elk district.

Fritz Bernstein, 50-year veteran in the utility field retired recently as purchasing agent for Consumers Public Power District.

Ken Bradfield, distribution engineer at Topeka for Kansas Power & Light Co, has been transferred to Hutchinson where he will be division superintendent.

Public Service Electric & Gas Co has promoted **John A. Inwright** to assistant general superintendent of generation of their electric department, **Earl C. McMahon** to superintendent of the Sewaren station, and **Gifford Griffin** from senior engineer, general office in Newark to chief engineer of the Sewaren station.

James S. DeLaurier, publisher of the Hammond Times, has been named to the board of directors of Northern Indiana Public Service Co.

Arkansas Power & Light Co has named **John F. Danner Jr** as division engineer of their Northeast Division.

Robert B. Donworth, vice president, engineering and construction of Duquesne Light Co received the 1956 Prime Movers Committee Award from the American Society of Mechanical Engineers, accepting it in behalf of himself and five other men who collaborated on a Geneva Conference paper which was presented in Switzerland during the summer of 1955.

Pacific Gas & Electric Co has promoted three men in its East Bay Division. **Douglas S. Aiken** becomes manager of the central district, **Carl C. Mak** succeeds Aiken as division commercial sales manager. And **Gerald C. Stanley** assumes Mak's former post of manager of the Bay district.

William J. Piper has been promoted to general superintendent for Detroit Edison Co, succeeding **Walter G. Knickerbocker,** who retired recently after nearly 40 years service with the company.

As a result of Kansas Power & Light Co's creation of a new managerial position at Lawrence, **Austin Stedham** has been made superintendent in that area. Other promotions at KP&L include: **Paul Anderson** as McPherson office manager, **Otis Jennin,** Lyons manager; **C. J. Hoke,** Marysville manager; **Harry E. Young,** Concordia Division Manager; and **Hilton Brann,** Great Bend Division Manager.

General Electric Co's large steam turbine-generator department has appointed **John Cuturilo** to its welding unit. Cuturilo will carry out applied research and development in the fields of arc and gas welding . . . **J. S. Gillespie** has been named manager of engineering for GE and will continue his former duties as acting manager of the industrial diamond project for the company's metallurgical products department . . . **Kenneth E. Fritz** was recently advanced to the metallurgy unit of the materials and processes laboratory of GE's large steam turbine-generator department.

E. S. Lee, an engineer with General Electric Co since 1913, retired last month. He is a former president of American Institute of Electrical Engineers.

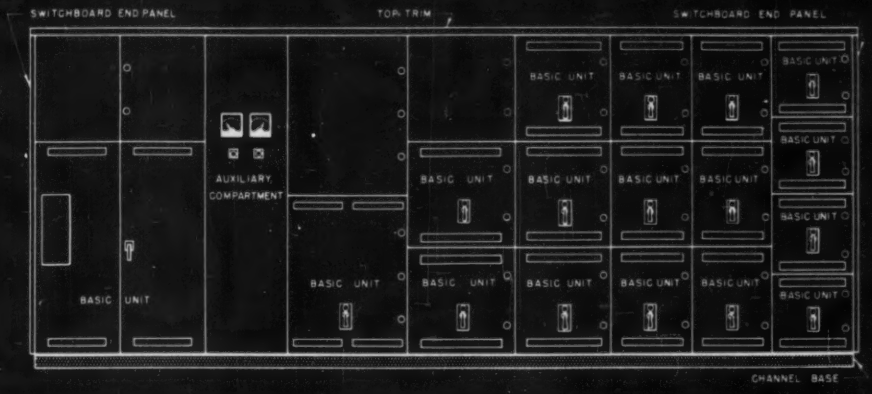
OBITUARY

Gen. Lewis A. Pick, 66, former head of the Army Engineers, died in Washington recently. Pick, who retired in 1953, had served in the Corps of Engineers for 36 years.

V. G. Shearer, 63, retired credit manager for the General Electric Co in the southeastern area, died following an extended illness.

J. Raymond Murphy, 62, district manager of General Electric Co's Apparatus Sales Division, died last month on a train enroute to Spokane, Wash.

I-T-E Low Voltage Switchgear



--the finest of modern switchgear factory assembled, shipped as a unit, ready to install in your plant

I-T-E Low Voltage Switchgear provides the optimum in dependability, safety, reduced maintenance costs, and attractive appearance. I-T-E Circuit Breakers have proved their worth in thousands of applications. I-T-E Structures are designed specifically to house and interconnect these time-proved protective devices and auxiliary equipment. When you combine the two, you have the finest of circuit breakers in the finest of structures. And you get the additional advantages of less special engineering, faster delivery, and units custom-made in standard frames to fit your requirements.

For complete information, consult your nearest I-T-E sales office. Or write I-T-E Circuit Breaker Company, 19th & Hamilton Sts., Philadelphia 30, Pa.

I-T-E CIRCUIT BREAKER COMPANY • Switchgear Division

MEETINGS CALENDAR

JANUARY, 1957

• **Edison Electric Institute**—Live Better—Electrically Women's Conference, Edgewater Beach Hotel, Chicago, Ill., Jan. 10-11; Industrial Relations Committee, sponsored jointly by personnel section of Southeastern Electric Exchange, Sheraton-Park Hotel, Washington, D. C., Jan. 17-18; Industrial Power & Heating Group, New Orleans, La., Jan. 17-18.

Northeastern Weed Control Conference — Sheraton-McAlpin Hotel, New York City, Jan. 10-12.

Doble Engineering Co—24th Annual Conference of Doble Clients, Sheraton-Plaza Hotel, Boston, January 14-18.

Southeastern Electric Exchange—Personal Administration Section Meeting, held jointly with EEI, Sheraton-Park Hotel, Washington, D. C., Jan. 17-18.

American Institute of Electrical Engineers — Winter General Meeting, Hotel Statler, New York, Jan. 21-25.

American Welding Society—Illinois Institute of Technology—3rd Annual Midwest Welding Conference, Illinois Tech Chemistry Bldg., Chicago, Ill., Jan. 30-31.

Missouri Valley Electric Association—Industrial & Commercial Sales Conference, Hotel President, Kansas City, Mo., Jan. 31-Feb. 1.

Pennsylvania Electric Association—Transmission & Distribution Committee, Penn Harris Hotel, Harrisburg, Pa., Jan. 31-Feb. 1; Hydraulic Power Committee, Brunswick Hotel, Lancaster, Pa., Jan. 31-Feb. 1.

FEBRUARY

• **Ninth Annual Industrial Engineering Institute**—University of California, simultaneous sessions in Berkeley and Los Angeles, Feb. 1-2.

National Association of Purchasing Agents—26th Annual Mid-Winter Conference, Public Utility Buyers' Group, Brown Hotel, Louisville, Ky., February 3-5.

• **Edison Electric Institute** — Commercial Lighting Committee, Feb. 4-5; Electric Space Heating & Air Conditioning Committee, St. Louis, Mo., Feb. 6-8; Dealer Coordination Committee, New Orleans, La., Feb. 7-8; Prime Movers Committee, Deschler Hilton Hotel, Columbus, Ohio, Feb. 4-6; Transmission & Distribution Committee, Netherland Plaza Hotel, Cincinnati, Ohio, Feb. 7-8; Electrical System & Equipment Committee, Somerset Hotel, Boston, Mass., Feb. 11-12.

National Electrical Week — Second Annual Observance, Feb. 10-16.

• **Pennsylvania Electric Association**—Communications Committee, Hotel Americus, Allentown, Pa., Feb. 11-12; Electrical Equipment Committee, Benjamin Franklin Hotel, Philadelphia, Pa., Feb. 7-8; System Planning Committee & Systems Operation Committee, Philadelphia, Pa., Feb. 14-15; Relay Committee, Roosevelt Hotel, Pittsburgh, Pa., Feb. 28-Mar. 1.

Electric Institute of Washington—Electrical Trade Conference & Exposition, Shoreham Hotel, Washington, D. C., Feb. 12-14.

American Institute of Electrical Engineers — 1957 Transistor & Solid State Circuit Conference, sponsored jointly with Institute of Radio Engineers and University of Pennsylvania, University of Pennsylvania, Philadelphia, Pa., Feb. 14-15.

National Society of Professional Engineers — Spring Meeting, Hotel Francis Marion, Charleston, S. C., Feb. 15-16.

13th Annual National Adequate Wiring Conference—Sherman Hotel, Chicago, Ill., Feb. 21-22.

• **North Central Electrical League**—20th Annual Upper Midwest Electrical Industry Convention, Leamington Hotel, Minneapolis, Minn., Feb. 24-27.

Institute of Radio Engineers—Western Joint Computer Conference, Hotel Statler, Los Angeles, Calif., Feb. 26-28.

American Society of Heating and Air-Conditioning Engineers—63rd Annual Meeting, Chicago, Ill., Feb. 25-28.

Pacific Coast Electrical Association—Business Development Section, Sheraton-Palace Hotel, San Francisco, Calif., Feb. 28-Mar. 1.

MARCH

Southern Safety Conference—John Marshall Hotel, Richmond, Va., Mar. 3-5.

Louisiana State University—Annual Conference on High-Speed Computers, Baton Rouge, La., Mar. 5-8.

Northwest Electric Light & Power Association—Business Development Section, Empress Hotel, Victoria, B. C., Mar. 18-20.

Edison Electric Institute—Industrial Relations Committee, EEI Headquarters, New York City, Mar. 21.

Pacific Coast Electrical Association—Engineering & Operating Section, Hotel Statler, Los Angeles, Mar. 21-22.

Oklahoma Utilities Association—Biltmore Hotel, Oklahoma City, Okla., Mar. 27-28.

Illinois Institute of Technology—19th Annual American Power Conference, Hotel Sherman, Chicago, Ill., Mar. 27-29.

APRIL

Southeastern Electric Exchange—Annual Meeting, Boca-Raton Hotel, Boca Raton, Fla., April 1-3.

• **Edison Electric Institute**—Main Accounting Conference held jointly with AGA, Washington, D. C., April 8-10; Accident Prevention Committee, Algiers Hotel, Miami Beach, Fla., April 28-May 1.

• **Eastern Electrical Wholesalers Association**—Fourth National Electrical Industries Show, 71st Regiment Armory, New York City, April 8-11.

• **American Welding Society**—Fifth Welding Show, Convention Hall, Philadelphia, Pa., April 9-11.

• Additions this week

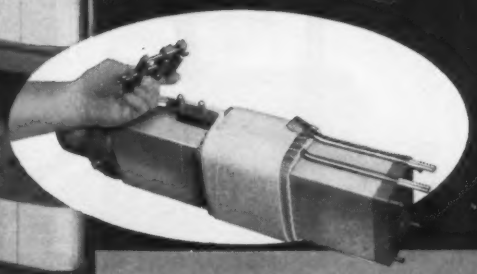
Cle Elum Coal Pact Pends

Now that construction of Washington State Power Commission's proposed $65-million steam generating plant in the Roslyn-Cle Elum area of central Washington has been found feasible, owners of coal properties in the area are working on terms of a contract through which they hope to supply coal for the 312,400-kw plant.

Power from the plant, operating about six months a year, would be combined with surplus hydroelectric power from Bonneville Power Administration for sale to utilities on the basis of combined demand-and-energy charge. The estimated resultant rate of about 5 mills per kwhr would compare favorably with the power from some of the new hydro plants now under consideration.

Washington State Power is seeking figures for a firm contract extending 20 to 30 years, according to a spokesman from one of the larger coal concerns. Cost of coal is one of the principal problems to be worked out before contracts can be negotiated with prospective customers of power. A $275,000 legislative appropriation is needed to prepare plans for the plant.

She goes to a felt-padded cupboard to fetch your POLE STAR coil a mold



Accurate dimensions — particularly in the core-and-coil assembly — contribute much to the dependability and efficiency of Pole Star distribution transformers. For that reason, coils are wound on precise, aluminum molds, which are given "kid-glove" treatment when not in use. High and low voltage molds are moved directly from felt-padded storage bins to the winding machine and vice versa, with no in-between reposal on tables or floor. Frequent inspection of all molds makes certain that the original precision is maintained.

With aluminum molds, end turns are tied in with spring clips; there is no marring of the mold surface such as when nails are used for this purpose with ordinary wooden molds. A further advantage is that aluminum is not subject to "aging," whereas wooden molds often dry up and crack or shrink, with consequent changes in dimensions.

Such concern with accuracy is typical of Pole Star production methods. It means outstanding quality and dependability . . . every time.

All Pole Star distribution transformer coils are wound on aluminum molds, which assure coil uniformity and also permit the use of special fixtures for accurate placement of leads. During winding, each low voltage lead—which is prebent to the desired radius on a jig—is held firmly in place by the two-piece clamping device shown above.

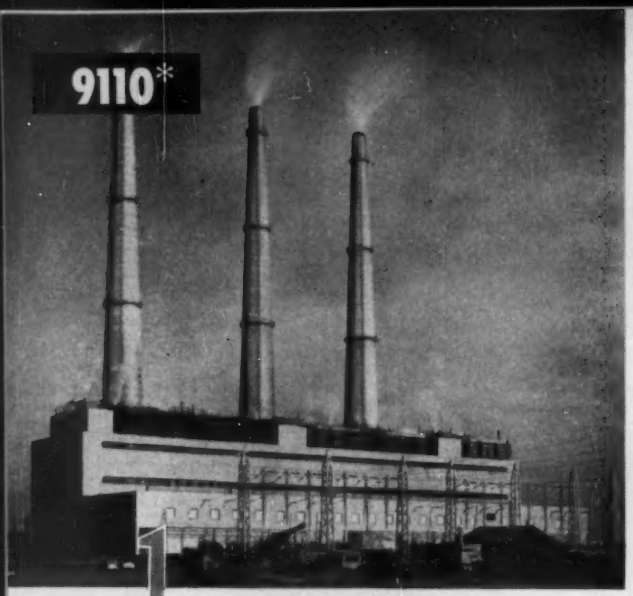
3 through 500 kva, through 67,000 volts

POLE STAR pt *167 Production Controls make Pole Star Best!*

PENNSYLVANIA TRANSFORMER COMPANY

A McGraw Electric Company Division

CANONSBURG, PENNSYLVANIA



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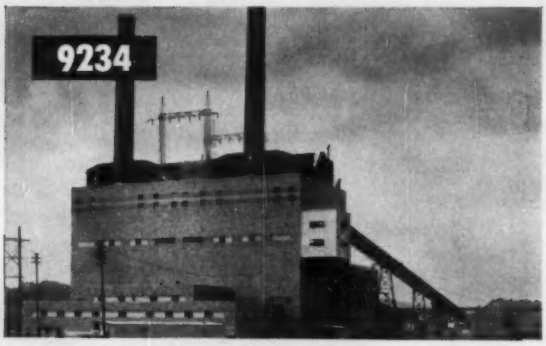
KYGER CREEK

Ohio Valley Electric Corporation

5 B&W Pressure-Fired Open-Pass Reheat Boilers with Gas Recirculation.

*Btu/net kwhr



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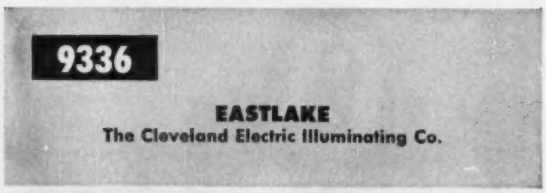
MUSKINGUM RIVER

Ohio Power Co. on the American Gas and Electric System

Two B&W Pressure-Fired Open-Pass Reheat Boilers with Gas Recirculation.



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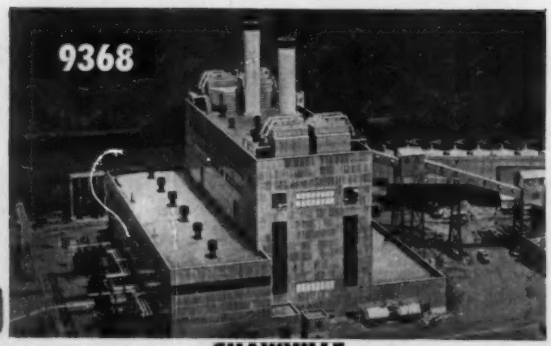
EASTLAKE

The Cleveland Electric Illuminating Co.



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SHAWVILLE

Pennsylvania Electric Co.

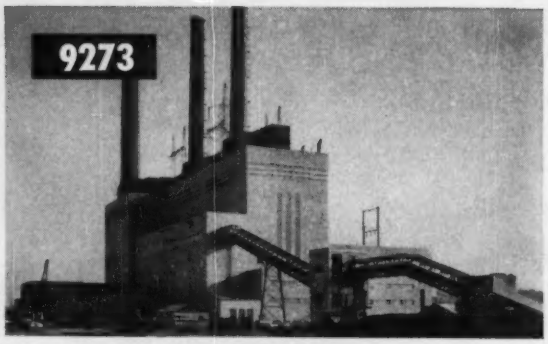
Two B&W Radiant Reheat Boilers with Gas Recirculation and Divided Furnace Construction.

2

CLIFTY CREEK

Indiana-Kentucky Electric Corporation

6 B&W Pressure-Fired Open-Pass Reheat Boilers with Gas Recirculation.



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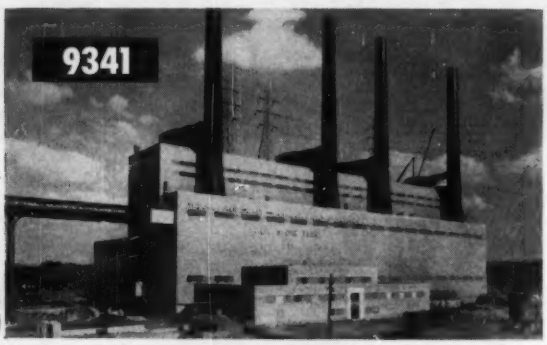
TANNERS CREEK

Indiana & Michigan Electric Co. on the American Gas and Electric System

Three B&W Pressure-Fired Radiant Reheat Boilers with Gas Recirculation and Divided Furnace Construction.



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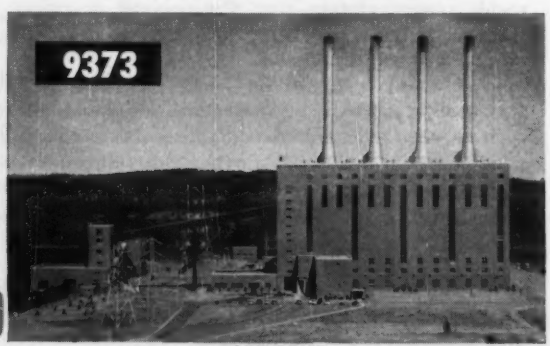
PHILIP SPORN

Appalachian Electric Power Co. & Ohio Power Co. on the American Gas and Electric System

Four B&W Pressure-Fired Radiant Reheat Boilers with Gas Recirculation and Divided Furnace Construction.



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ALBANY

Niagara Mohawk Power Corporation

3

KANAWHA RIVER
Appalachian Electric Power Co. on the American Gas and Electric System
Two B&W Pressure-Fired Radiant Reheat Boilers with Gas Recirculation and Divided Furnace Construction.

4

ST. CLAIR
Detroit Edison Co.
Four B&W Radiant Reheat Boilers with Gas Recirculation and Divided Furnace Construction.

These 10 Power Plants Tell WHY AMERICA'S ELECTRIC COSTS STAY LOW

Engineering Development and Research Pay Off in Increased Efficiency

The most efficient power plants in the United States in 1955, as reported by the Federal Power Commission, are led by the two largest investor-owned† power plants in the world—Kyger Creek, with 9110 Btu per net kwhr, and Clifty Creek, with 9143.

These ten stations — and the many others like them throughout the country—exemplify the foresight and progressiveness of American public utility management. They have quickly put "on the line" major engineering advances in power generation.

FIVE YEARS AGO only two plants operated under 10,000 Btu per net kwhr. In 1955, there were 41. This progress has been gained by the united effort of electric companies and their primary suppliers to produce more electricity more efficiently, and at a continued low cost to the consumer.

TODAY'S TRIUMPHS in keeping power cheap are only a step on the way to greater achievement. Already there are plants in operation or being built which will have heat rates of 8500 Btu per net kwhr—and research is being intensified to gain even lower levels. At the same time, American utilities and their suppliers are steadily pushing the use of nuclear energy on a massive scale.

B&W RESEARCH AND DEVELOPMENT, with a background of knowledge covering nearly a century of boiler engineering, design, and fabrication, continues to move ahead, with America's electric companies, to attain ever higher levels of steam-electric generating efficiency with conventional fuels and to open new horizons with atomic energy. The Babcock & Wilcox Company, Boiler Division, 161 East 42nd Street, New York 17, N. Y.

†Ohio Valley Electric Corporation and its subsidiary, Indiana-Kentucky Electric Corporation, sponsored by these companies:
Appalachian Electric Power Company* • The Cincinnati Gas & Electric Company • Columbus and Southern Ohio Electric Company • The Dayton Power and Light Company • Indiana & Michigan Electric Company* • Kentucky Utilities Company • Louisville Gas and Electric Company • Monongahela Power Company** • Ohio Edison Company • Ohio Power Company* • Pennsylvania Power Company*** • The Potomac Edison Company** • Southern Indiana Gas and Electric Company • The Toledo Edison Company • West Penn Power Company**

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BABCOCK & WILCOX

BOILER DIVISION

G-821-CS

Distribution Voltages Clarified

Different secondary level characteristics (as tabulated) remain subject of continuing debate among utility and electrical manufacturers' engineers

H. M. JALONACK, Chairman, ASA C 57 Subcommittee on Power and Distribution Transformers, West Redding, Conn.

Although secondary distribution voltage has been the subject of extensive discussion during the past year, differences of opinion still exist as to the relative economics of single versus 3-phase distribution and there is some question as to the voltage level at which future loads should be served. It is obvious that the type of load and its location have an important bearing on the choice of voltage, as well as on whether the supply should be single or 3-phase.

Because of the numerous voltages involved, some indecision about names applied to identical voltage systems, and the different types of load under discussion, there is considerable confusion in the minds of many engineers.

In some cases, disagreement on secondary voltage is based only on mutual misunderstanding as to the areas under discussion and the label to be applied to the voltage class. This article summarizes the status of the various secondary voltages from a system and equipment standpoint, outlines today's area of standardization, discusses briefly the unstandardized areas, and clarifies the secondary voltage picture.

It is important to distinguish between what the low-voltage system is named and how the transformer supplying it is rated. The system is preferably, but not always, named from the normal voltage level supplied to the consumer. The transformer voltage is always its low-voltage rating at no load. Three-phase systems usually are named with the voltage to neutral shown first followed by the line-to-line voltage. Transformers are rated with the line-to-line voltage first followed by the line-to-neutral voltage.

For example, a 120/208Y network system is supplied from network transformers rated 216Y/125; a 265/460Y system, by 3-phase transformers rated 480Y/277 v. Although primary taps usually are available to adjust the secondary level to the desired system level, the transformer's secondary voltage rating remains the same.

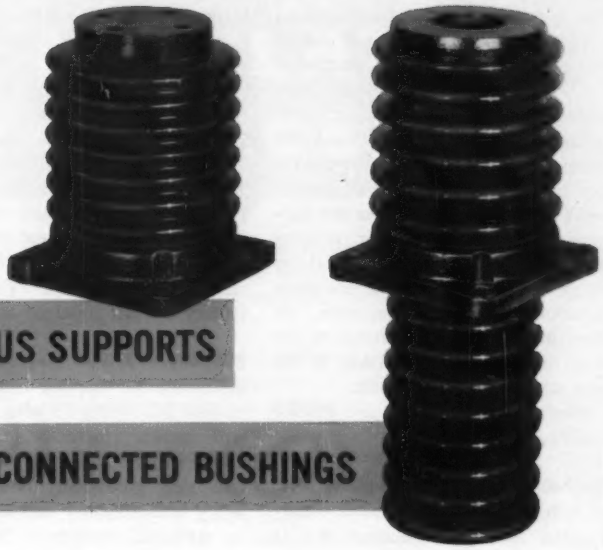
All differences of opinion have not been resolved between various utility and manufacturing company engineers. But it is desirable that agreement be reached soon on the desirable no-load voltage level for transformers supplying the several types of load and

Standard Transformers Provide Most Service Voltages

Distribution Service	Predominating Usage	Standard Transformer LV Ratings	
		1-phase	3-phase
Single Phase Service			
120-v 2-wire (1 side grounded)	Low consumption residential	120/240	208Y/120 240Δ* 480Δ* 240 x 480Δ*
120/240-v 3 wire (Midpoint grounded)	General residential	120/240	240Δ* 240 x 480Δ*
240-v 2-wire (1 side grounded)	Possible future residential	120/240 240/120 240/480 240 x 480	240Δ 240 x 480Δ*
240/480-v 3-wire (Midpoint grounded)	Possible future residential	240/480	No standard
3 Phase Service			
120/208-v 4-wire	Commercial and residential	120/240 (120-v connection)	216Y/125(Network) 208Y/120
240/416Y 4-wire	Network, industrial, and commercial. Future residential	120/240 240/120 240/480 240/480 (240-v connection)	No standard
265/480Y 4-wire 277/480Y 4-wire	Network, industrial, and commercial. Future industrial	No Standard	No standard †
240Δ 3-wire	Predominantly industrial (Trend is 120/208Y)	120/240 240/120 240/480 240 x 480 (240-v connection)	240Δ 240 x 480Δ
480Δ 3-wire	Predominantly industrial (Trend is 277/480Y)	240/480 240 x 480 (480-v connection)	480Δ 240 x 480Δ

* 120 v obtained from 120-v reduced-kva mid-tap in one phase of the secondary on distribution transformers rated 150 kva and below, 95 Kv BIL and below. Tap is brought out through a fourth low-voltage bushing and is designed for lighting loads of not more than 5% of rated kva.
† ASA has accepted 480Y/277 v as a power transformer standard in certain kva and primary voltage ratings. Load center transformers with 480Y/277 v are now manufacturers' standard.

No question of responsibility with



Lapp INDOOR SWITCH AND BUS SUPPORTS

Lapp BACK-CONNECTED BUSHINGS

RATING, Kv		2.5	5	7.5	15L	15H	23	34.5
1.5 x 40 withstand, Kv		45	60	75	95	110	150	200
60 — withstand, Kv		15	19	26	36	50	60	80
CLASS A	A-10	X	X	X				
	A-20		X	X	X	X		
	A-30		X	X	X	X	X	
CLASS B	B-20		X	X	X	X		
	B-30			X	X	X	X	X
	B-40			X	X	X	X	X
	B-50			X	X	X	X	X
CLASS D	D-20			X	X	X		
	D-30			X	X	X	X	X
	D-40			X	X	X	X	X
	D-50			X	X	X	X	X

Throughout the range of NEMA standards (SG6-6.06) . . . in three design types, in five strength groups, and in voltage ratings 2500 to 34,500 . . . Lapp Indoor Bus Supports and Lapp Back-Connected Switch Bushings are *matching* series. They match in heights, diameters, strengths, and electrical characteristics.

But, in specifying Lapp bus supports and back-connected bushings, you gain more than the convenience and economy of interchangeability. Yours also is the assurance of single responsibility for performance of porcelain, metal parts and complete insulator assembly. And Lapp responsibility always means an extra margin of operating security, low upkeep and long life.

Available as standard or on specification from all leading switch manufacturers.

◀ Lapp Indoor Switch and Bus Supports and Lapp Back-connected Bushings are available as catalog items in matching voltage ratings, strength groups and design classes as indicated at left.

Lapp Insulator Co., Inc., Le Roy, N. Y.

Lapp

on primary taps. Too many secondary voltage ratings on transformers or too much delay in setting such ratings works economic hardship on manufacturers and purchasers alike. The time to decide these ratings is long overdue.

120-V 2-Wire Single-Phase service is usually supplied from a single-phase, 3-wire, 120/240-v system, but can be supplied from one line and neutral of a 120/208Y 3-phase system also. Single-phase transformers are predominantly used to supply this 120-v system. Either single or 3-phase units may be used for 120/208Y service. Two-wire 120-v service does not represent adequate wiring for modern loads. Its use remains substantial for marginal homes, locations where space limitations prevent changeover, or where inertia or lack of funds to the home owner delay conversion to the more adequate 3-wire system.

Standard transformers are readily available.

120/240-V, 3-wire, single-phase service with midpoint grounded is widely accepted as today's adequate wiring in combination with 100-amp service entrances (200 amp recommended in some areas). It is usually supplied from a 120/240-v single-phase distribution transformer, but can be supplied in limited amount from one leg of a 3-phase transformer.

There has been considerable discussion as to whether this voltage will be adequate for future heavy residential loads. It appears quite certain, however, that it will be the prevailing residential voltage for years to come, replacing the 120 v 2-wire in many homes. General practice has been to supply 240 v in the home at a major application center, such as the kitchen, and 120 v, two-wire branches to smaller loads throughout the house. A more recent concept is to make 120/240-v available at all receptacles throughout the house, so that either 120-v or 240-v equipment can be connected. It may be replaced by a higher secondary voltage in new homes heavily equipped with electrical facilities.

240-V, 2-Wire, Single-Phase service could be supplied from a single-phase 240-v system with one side grounded or a 240/480-v 3-wire system with the neutral wire grounded. It could also be supplied from one line and neutral of a 240/416Y, 3-phase system.

This service could supply residences wired for 2-wire service to feed 240-v appliances directly, providing the National Safety Code would permit this voltage to ground. Appliances, lights, etc, not suitable for this voltage, could be fed at 120 v by a stepdown auto-transformer at the service entrance. The over-all economics of this system obviously require careful study.

Standard single-phase transformers rated 120/240 v are suitable for 240-v 2-wire service. There are standard autotransformers available for any 120-v 2-wire requirements, but it is possible that widespread use for this purpose might encourage redesign for optimum characteristics. Three-phase transformers with a 416Y/240-v secondary are not standard at present.

240/480-V 3-Wire Single-Phase service would be supplied from a single-phase 240/480-v 3-wire secondary with neutral conductor grounded. It could supply residences with 240 v, one side grounded, for appliances, lights, etc. It could also supply 480-v to electrical equipment requiring it. Appliances and lights requiring 120 v could be supplied from stepdown autotransformers.

Much controversy exists as to the desirability of this supply level for residences. The principal factors to be considered are savings to the utility, savings to consumers, cost of appliances and lamps for this voltage, safety, design of appliances and lamps now developed for 120 v, and the possibility of gradual evolution to the higher secondary level through initial use in residences having very large electrical requirements.

Standard single-phase distribution transformers are available with 240/480-v secondary. Single-phase transformers with 120/240-v secondary can be used in pairs to provide 240/480-v service. This combination, although not as efficient nor as economical as a single larger unit, would be a way of utilizing existing equipment.

120/208Y-V, 3-Phase service has applications in network systems, commercial and industrial establishments, and residential areas. Service for low-voltage networks is usually from 3-phase network transformers rated at a voltage level that fits user voltage. Thus network transformers might be rated 208Y/120 v although 216Y/125 is more usual. Commercial loads at this voltage might be supplied from a 3-phase network or 3-phase conventional transformer rated 208Y/120 or three single-phase transformers with secondaries connected in wye in non-network areas.

Prevailing low-voltage network systems are in the 120/208Y class. But some new large office buildings and commercial units requiring very large amounts of electrical energy are now being supplied on a spot-network basis at approximately double this voltage, even though they are physically within the 120/208Y-v network area.

Outside the network area small 3-phase loads are often handled at 120/208Y. But shopping centers, auditoriums, and other buildings with large energy requirements are rapidly adopting the higher secondary level. Some industrial applications use 120/208Y v, but the trend has been to the higher voltage, ante-dating more recent applications to other types of load.

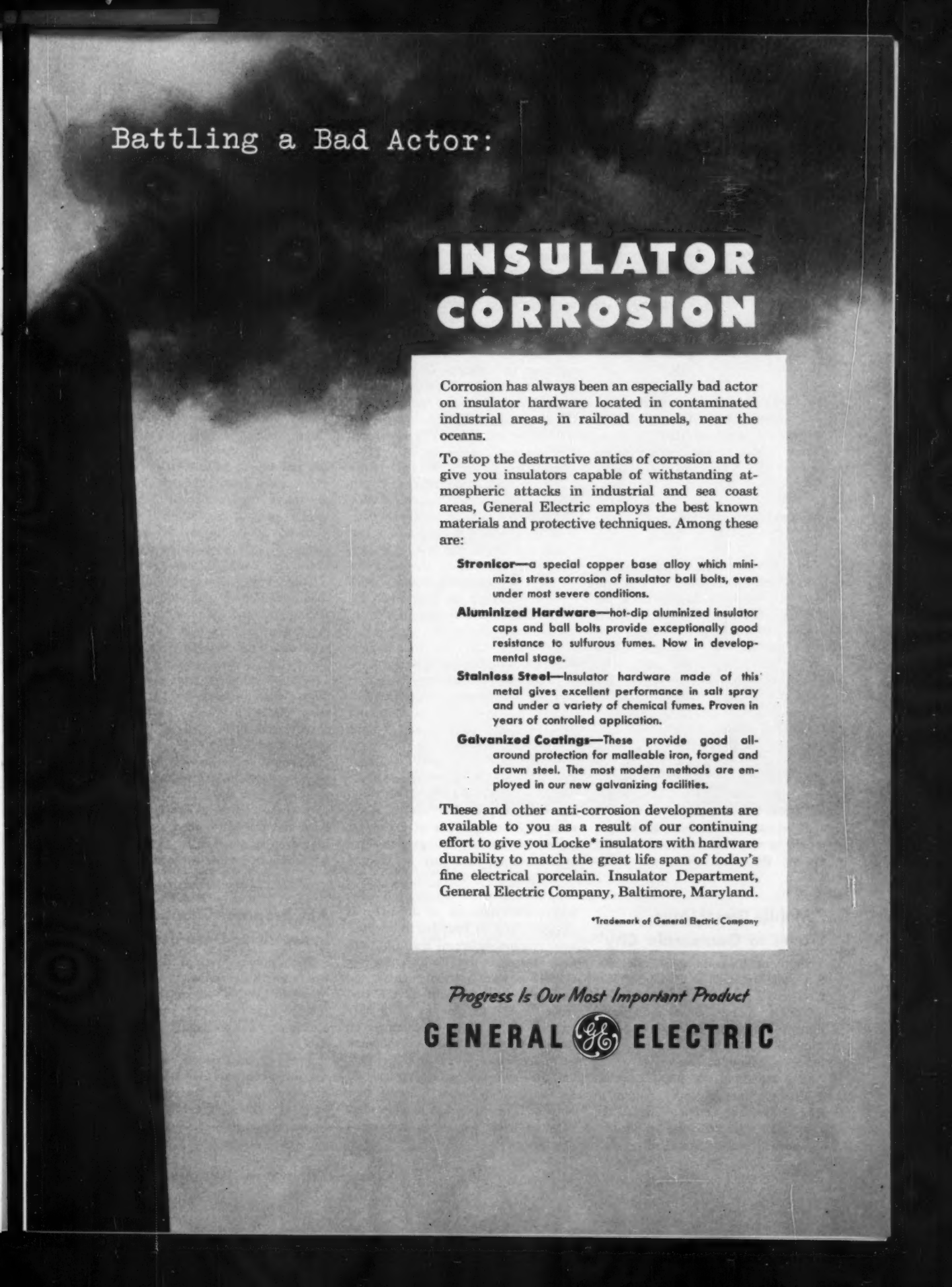
In residential areas, particularly those adjoining a 120/208Y network, there has been some application of this voltage.

Standard single-phase transformers 167 kva and smaller and 3-phase transformers of conventional and network types are available to supply this voltage system. Standard single-phase transformers 250-500 kva until recently have been rated 240/120 v 3-wire and have not been suitable for 208Y/120-v connection. The ASA is now balloting to change these kva ratings to 120/240 v to make them suitable for either 120/240-v 3-wire, or 208Y/120-v connection. This will take care of the increased usage of this voltage in larger bank capacities.

240/416Y-V 3-Phase 4-Wire service represents a system voltage designed to harmonize with 240-v 2-wire or 240/480-v 3-wire single-phase systems. It could be supplied from new 3-phase transformers rated 416Y/240 or 432Y/250 v or from single-phase transformers rated 240 v connected in wye.

This voltage is used occasionally to supply 440-v motors from 240-v single-phase transformers. Its advocates believe it more suitable for future use than 480Y/277-v transformers because of its compatability with 240-v 2-wire service in resi-

(*Continued on page* 48)



Corrosion has always been an especially bad actor on insulator hardware located in contaminated industrial areas, in railroad tunnels, near the oceans.

To stop the destructive antics of corrosion and to give you insulators capable of withstanding atmospheric attacks in industrial and sea coast areas, General Electric employs the best known materials and protective techniques. Among these are:

Stronicor—a special copper base alloy which minimizes stress corrosion of insulator ball bolts, even under most severe conditions.

Aluminized Hardware—hot-dip aluminized insulator caps and ball bolts provide exceptionally good resistance to sulfurous fumes. Now in developmental stage.

Stainless Steel—Insulator hardware made of this metal gives excellent performance in salt spray and under a variety of chemical fumes. Proven in years of controlled application.

Galvanized Coatings—These provide good all-around protection for malleable iron, forged and drawn steel. The most modern methods are employed in our new galvanizing facilities.

These and other anti-corrosion developments are available to you as a result of our continuing effort to give you Locke* insulators with hardware durability to match the great life span of today's fine electrical porcelain. Insulator Department, General Electric Company, Baltimore, Maryland.

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Progress Is Our Most Important Product

GENERAL ELECTRIC

Distribution Clarified

(*Continued from page* 46)

dential areas, should this service ever become practicable. Adoption of a 240Y/416Y-v secondary level, instead of the more commonly specified 265/-460Y, depends almost entirely on whether 240-v 2-wire one-side-grounded supply can become an acceptable residential service.

Standard 3-phase transformers are not available to supply 416Y/240 v. But this voltage is readily obtainable from standard single-phase transformers.

265/260Y-V 3-phase service, sometimes called 277/480Y or 255/440Y, is basically supplied from a transformer whose no-load voltage rating is 480Y/277. Taps on the primary winding and selection of the optimum primary rating of the supplying transformer are means of adjusting the transformer rating to the system.

In network systems the voltage level is established as 265/460Y. This represents a reasonable level as far as the consumer is concerned. For industrial systems, where the usual practice is to place the units at load centers, the system is usually called 277/480Y. For other applications the system may operate at slightly different levels.

It is generally agreed that for spot networks, industrial loads, and substantial concentrations of load in other areas, secondary supply at approximately double the 120/208Y-v system has many important advantages for the utility and consumer.

Substantially similar advantages would be obtained from a 240/416Y system. But those who prefer 265/-460Y or 277/480Y believe that 440-v utilization equipment should not be subjected to the low-voltage problems experienced with 220-v utilization equipment on 208-v systems.

There have been advocates of 265/460Y or 277/480Y for residences both as single-phase from line to neutral and as a 3-phase supply. Use of this voltage either as single-phase or 3-phase supply is subject to substantial controversy, both as to economics and safety.

Standardization of transformers has not been achieved because of the differences of opinion on the exact secondary rating. Three-phase load-center transformers for industrial distribution with 480Y/277-v secondaries are readily available. ASA agreement was reached recently on 480Y/277-v secondaries as an acceptable power transformer standard in certain kva ratings and primary voltage classes. The primary taps on industrial units have been generally accepted as two 2½% taps above and two 2½% taps below normal. But on network transformers one school of thought tends toward straddling the taps while another tends toward having all taps below normal.

Straddling taps for transformers with this secondary rating presents the practical compromise, considering all types of transformers. This choice of primary taps provides a common ratio between single-phase and 3-phase transformers for the 240/416Y and 265/460Y (or 277/480Y) systems. For example, standard single-phase transformers rated 120/240 or 240/-120 v have four 2½% taps below rated high voltage. Use of the lowest tap on full primary voltage with some over-excitation will give a no-load voltage of 264 and a resulting 3-phase voltage of 457 v.

If 277-v single-phase transformers or 480Y/277-v 3-phase transformers are standardized with two 2½% taps above and below the high-voltage rating (as is the standard 480-v delta unit) then the top tap at normal applied voltage will give a low voltage of 456 v. Admittedly this narrow field of correlation would be suitable primarily for emergency operation only.

In view of the rapidly increasing usage of 3-phase transformers in this general voltage class, there is urgent need for completing the standardization to a point where purchasers of transformers for a 277/480Y-v secondary application will obtain maximum benefits in cost and delivery.

240 and 480-V, 3-Phase Delta systems are supplied from either single-phase or 3-phase transformers with no-load voltages of 240, 480, 240/480, or 240 x 480v, depending on the primary voltage type, phase, and kva of the transformers used as a power source.

These voltages are predominantly used to supply 220 or 440-v motors and utilization equipment where a delta-connected supply is desired. In most newer industrial installations the 240-v delta system is giving way to 120/208Y supply. Similarly 440-v motors and equipment are supplied in most industrial installations from transformers with no-load low-voltage ratings of 480Y/277.

Standard transformers have long been available to supply these utilization voltages. But in certain types, such as the load center unit, the 240-v delta and the 480-v delta secondaries may drop so much in usage that only wye-connected units will remain.

7 Mobile Diesel Units Travel to Guatemala City

Empresa Electrica de Guatemala, S.A., an American & Foreign Power Co subsidiary, is installing seven 1,000-kw mobile diesel generating units to meet an emergency power shortage brought on by the increasing industrialization in Guatemala.

The expansion will bring Empresa Electrica's total potential output to 27,170 kw. The company serves the Guatemala City area primarily.

The new mobile units are on railway trucks. Because of difficulty in shipping them by boat due to low tunnels existing between both the rail lines between the Pacific and the Caribbean ports of the country, the units are being brought all the way from the General Motors plant near Chicago via Mexico to Guatemala on their own wheels. They are mounted on standard gage wheels to utilize U.S. and Mexican standard gage tracks. At the Guatemalan border, however, they must be changed to narrow gage units in order to fit the railway tracks of that country.

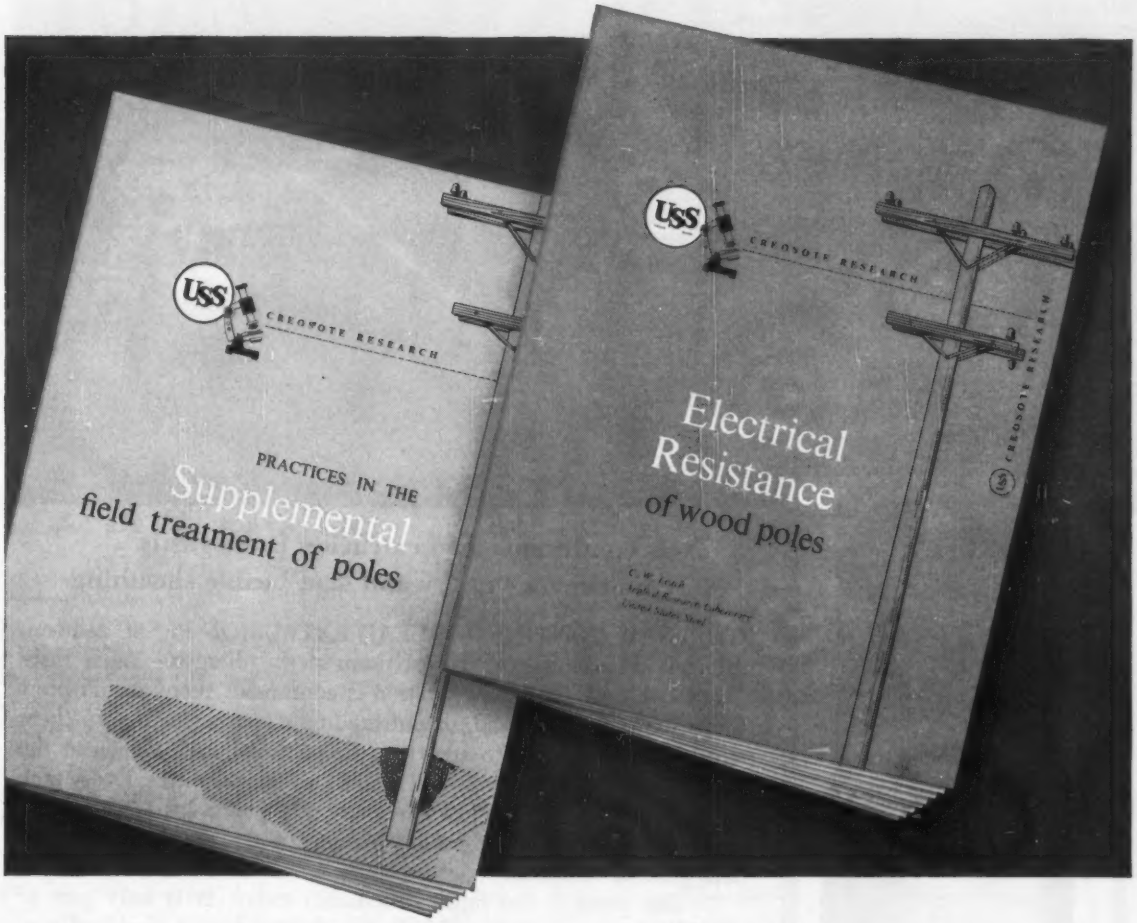
AEC Proposes Change in Restricted Data Use

With public hearings pending on the Power Reactor Development Co's proposed Detroit project, the Atomic Energy Commission is proposing to amend its rules on handling restricted data.

The proposed amendment is designed to ensure that no restricted data is used in the hearings. If such data has to be used, the hearings may be suspended until clearance for the material is obtained.

FREE FOR UTILITIES

...useful information on poles!



In these booklets, U. S. Steel Research has compiled useful data on poles. This information is available to utilities through their wood treaters.

One booklet—"Electrical Resistance of Wood Poles"—covers the many factors that affect electrical resistivity. For example, it explains how creosote, in poles, actually retards the absorption of moisture.

The other booklet—"Supplemental Field Treatment of Poles"—discusses many techniques in the groundline treatment of poles already in service. *It emphasizes, however, that such supplementary treatment is no substitute for thorough initial impregnation with a proved preservative. It also recommends that your pole supplier be questioned as to the advisability of re-treating or replacing old poles.*

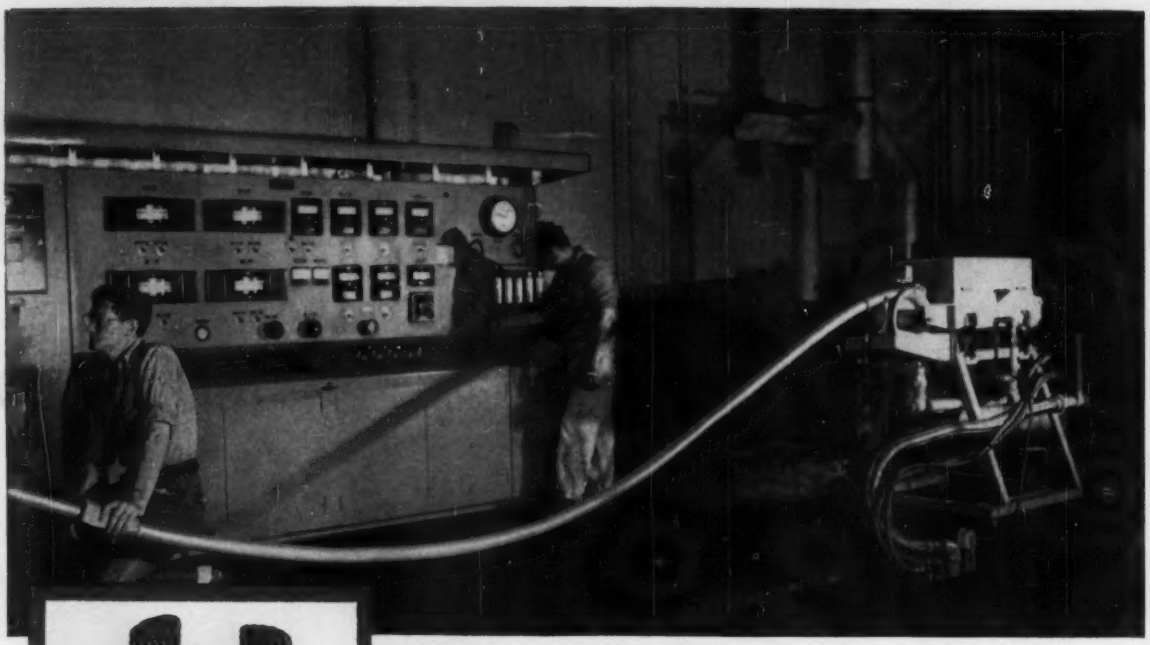
Both of these booklets are free for the asking. Get them from your nearest Treater of Pressure-Creosoted Poles, or write to United States Steel, Market Development Division, 525 William Penn Place, Pittsburgh 30, Pa.

USS CREOSOTE

SALES OFFICES IN PITTSBURGH, NEW YORK, CHICAGO, CLEVELAND, SALT LAKE CITY, AND FAIRFIELD, ALA.

UNITED STATES STEEL

ROEBLING INVESTS IN YOUR FUTURE



New continuous lead extrusion press vastly improves "paper and lead" cable sheathing

THIS NEW CONTINUOUS LEAD EXTRUSION PRESS and control board revolutionize the extrusion of sheathing for Paper Insulated Cable. Because its operation is continuous there are no press stops, no recharging and, of outstanding importance to you, *there are no charge welds.* In addition, the control board, shown at the left, automatically controls and records all temperatures. Every inch of the resultant cable is just like every other inch...the "paper and lead" cable sheath is perfect in its concentricity, physical properties and general uniformity.

This press is the finest obtainable today. It is only part of Roebling's program of modernization for producing electrical conductors of modern, high quality.

Our engineering and metallurgical staffs are always glad to consult with you on your individual cable problems. A letter or phone call will bring action.

ROEBLING ELECTRICAL WIRES AND CABLES ARE AVAILABLE WITH EITHER COPPER OR ALUMINUM CONDUCTORS

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 11-15 STILLING ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 2340 GLENDALE-MILFORD RD., EVENDALE • CLEVELAND, 13335 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • PITTSBURGH, 1723 HENRY W. OLIVER BLDG. • SAN FRANCISCO, 1740 17TH ST. SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.

▲ **SIX-ROOM HOME follows Chicago builder's standard style. With "four seasons" idea added. Price tag: $47,000**

SPECIAL METERS, top, furnish Commonwealth Ed with demand data. House has 200-amp entrance and 24 circuits ▶

62-Kw Home Banishes Climate Cares

SALES
Residential

Chicago builder develops "four seasons" concept that includes heat pump supplemented by 16-kw resistance heat unit in air duct. Commonwealth Edison joins promotion

The Chicago area's first "four seasons" home has been opened for public inspection in the Springdale development at Western Springs, Ill.

This latest version of the all-electric home boasts a 61,075-watt connected load. It is a standard type of six-room, three-bedroom house. But the builder made it all-electric and advertised it as a "four seasons" home that will provide ideal temperatures throughout the year. To furnish this comfort, the builder installed a 7½-hp heat pump and supplemented it with a 16-kw resistance heating unit in the air duct.

An interesting feature of the house is a 200-amp service entrance switch which is fed from an underground transformer installation by three No. 3/0 underground service conductors. Special meters were installed at the service entrance to furnish information on demand and kilowatthour use by some of the electric equipment, particularly the heat pump.

Eight of the 24 circuits in the house are 240 v. An electrical outlet channel runs just above the baseboard in the living room, dining room, and three bedrooms. It provides duplex receptacles on five-ft centers.

Commonwealth Edison Co took the opportunity to promote the house and the concept of electrical living. The utility staffed the house for three weeks when it was open for public inspection. The company also participated in advertising the electrical features of the house.

The table below gives a complete break-down of the 61,075-watt connected load.

How to Build a 61,075-Watt Connected Load

Equipment	Watts
Resistance Heating in Air Ducts	16,000
Heat Pump	11,000
Range Surface Units	7,500
Water Heater	6,500
Lighting	5,500
Clothes Dryer	4,800
Electronic Oven	3,300
Range Surface Units	3,200
Dishwasher	1,225
Garbage Disposer	750
Automatic Washer	400
Electric Garage Door	250
Mixer and Clocks	200
Refrigerators	200
Freezer	150
Intercom System and Radio	100

Despite age and service, this creosoted pole was in good condition when . . .

Age: 63 and Still Young

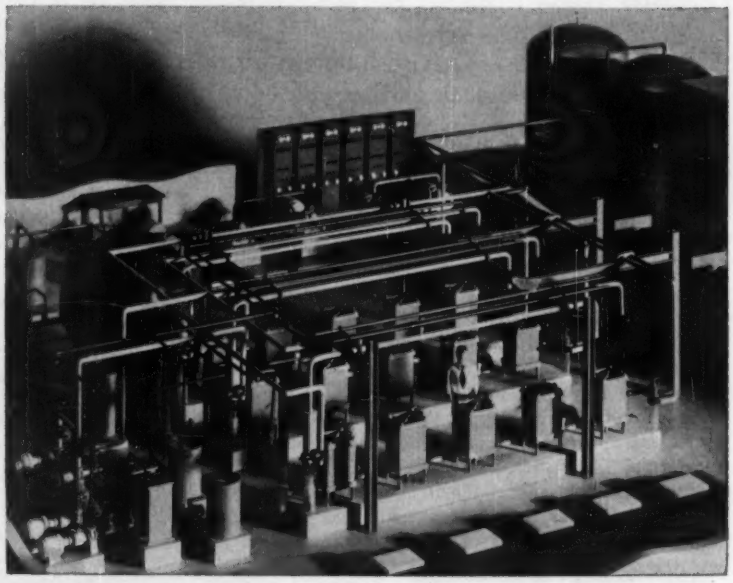
. . . Holmes (right) bought it

When R. R. Holmes returned to the United States, he brought his company three trophies from England. The genial vice-president and general manager of Koppers Co turned over to the tar products lab three creosoted Scots Pine poles which served 63 and 64 years along a rural Dorchester road. The lab will find out how much creosote remains in the wood.

Untreated, this type wood is highly susceptible to decay. But these poles show no signs of wear or damage, except for spike marks. They have withstood zero to 90F temperatures, gale winds, and England's characteristic rainy dampness. There are no signs of termites or fungus, even on the eight feet which have been underground all these years. English officials pronounced them "fit for re-issue," and said similar poles 80 years old are still in use.

The English have creosoted poles since 1870. The U. S. adopted the practice after 1900.

They're Desalting Water Electrically on Behrain Island



This rig yields 1,000 gal fresh water per 15 kwhr

They're taking the salt out of water with electricity on a little island about 20 miles off the coast of Saudi Arabia in the Persian Gulf. The Bahrain Petroleum Co, Ltd, has installed a plant (see model in photo) to produce 86,400 gpd of fresh water for a community of about 5,000 on Behrain Island.

Developed by Ionics, Inc, Cambridge, Mass., the new plant becomes the largest of its kind in the world. Its installation follows successful operation of a smaller plant put on Behrain more than a year ago. (In the U. S., similar but smaller plants are being used in Montana, New Mexico, Texas, and on "Texas Tower" radar stations off the northeast coast.)

Input water for the Behrain plant comes from wells drilled on the island within sight of the Persian Gulf. These wells yield water only 1/14 as salty as the Gulf's waters. Fifteen kwhr makes 1,000 gal of fresh water, which has the "zip" that distilled water lacks.

The Behrain plant has 15 desalting units connected in three parallel banks of five series units. Each unit removes up to 40% of the salt remaining in the water. Input water having 3,100 ppm of dissolved solids emerges with a count of only 450 ppm.

The process capitalizes upon the ionic breakdown of salt molecules dissolved in water. Direct current forces salt ions into traps for expulsion.

SELKYD–a new kind of plastic improves watthour meter base plates

and Sangamo brings it to you!

In order to find the ideal material from which to mold watthour meter base plates, Sangamo and Glaskyd, Inc., pooled their efforts.

The result is Selkyd.*

A Selkyd base plate on a watthour meter has many advantages. It resists corrosion. It has a high resistance to arc tracking. Having great impact strength, a Selkyd base plate will stand up to physical punishment. And because Selkyd is an inert organic substance, base plates made from it have great dimensional stability.

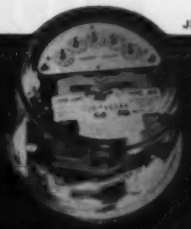
Adoption of this Selkyd base has in no way altered the electrical characteristics of the J2.

Every Sangamo J2S meter you buy will come to you with a base plate made from this remarkable new plastic . . . and at no extra cost.

Selkyd base Sangamo meters will be shipped to you sealed. You'll find them so accurately calibrated . . . so solidly built . . . that no adjustment is necessary.

**A thermosetting resin combined with glass fibers—in contrast to ordinary phenolics having wood fibers as a filler.*

JM56-3



SANGAMO ELECTRIC COMPANY

SPRINGFIELD, ILLINOIS

Powering the glow of the Fontainebleau!

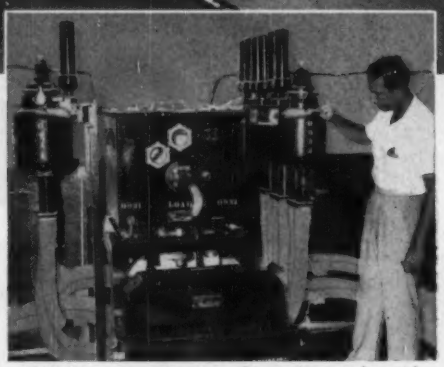
G & W AND FLORIDA POWER & LIGHT COMPANY WORK BEHIND THE SCENES HELPING FLORIDA GROW!

Florida Power & Light Company, serving one of the nation's fastest growing areas, uses the most modern equipment to provide dependable power for Florida's new homes, businesses and industries.

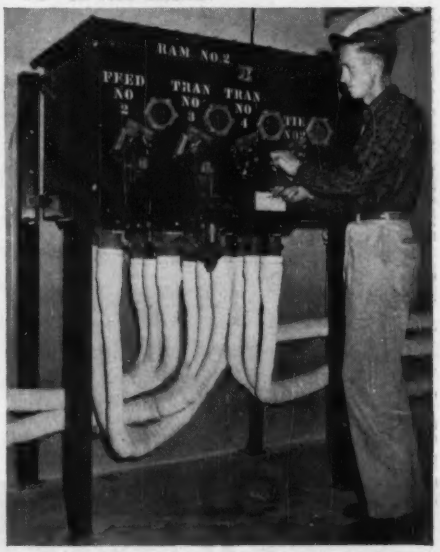
For the giant Fontainebleau Hotel, fabulous Miami Beach showplace, Florida Power & Light Company chose G & W "RAD" automatic oil switches and "FC" oil fuse cutouts to handle the 13.2 Kv. supply circuits into the hotel, and G & W "RAM" oil switches for power distribution throughout the building.

If you, like Florida Power & Light Company, wish to assure dependable operation of your distribution system, specify G & W!

G & W type "RA" oil switches, like these at the Fontainebleau, have had a remarkably trouble-free record . . . they combine simplicity with economy in construction, installation, and maintenance . . . provide for prompt restoration of service, isolation of cable sections, and rerouting of circuits in emergencies.



"RAD" automatic transfer oil switch with "FC" oil fuse cutouts.



"RAM" load break 4-way oil switch.

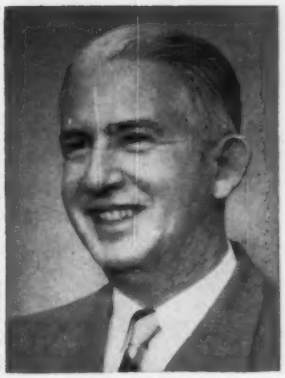
D566

G & W ELECTRIC SPECIALTY CO.
3500 W. 127th St., Blue Island, Ill.
Representatives in principal cities of U. S. A.
Also made in Canada by Powerlite Devices, Ltd., Toronto, Montreal & Vancouver

HOUSEPOWER 1957: Plans & Promotion

- Better intra-industry cooperation
- 5 basic objectives in 1957

GEORGE



McQUISTON

HOUSEPOWER 1957 promotional plans are being sparked this coming year by (1) a much wider, more closely coordinated participation of industry associations, and (2) five basic objectives, including wider consumer recognition, increased enthusiasm in allied trade fields, a better integration of HOUSEPOWER 1957 with other industry programs, a speeding up of the selling machinery, and finally a showing of specific results in more rewired homes.

That's the story the press and industry representatives were told when HOUSEPOWER 1957 Program Plans were presented in a conference in New York City on Wednesday, December 12th.

Housepower Objectives Expanded

Following a summary of HOUSEPOWER's 1956 accomplishments by T. O. McQuiston, EEI's Commercial vice president, Ed George, chairman of the EEI Wiring Promotion Committee (the group that develops HOUSEPOWER), said "In 1956 we set up certain basic objectives as the foundation for this program. 1957 is the year to sustain and broaden these objectives . . . the year to add momentum and depth to the HOUSEPOWER concept."

According to George, the HOUSEPOWER plan to fulfill the five goals mentioned above has two main elements:

• A long-range, backbone advertising program in nationwide mass media to increase consumer education and motivation, *pre-sell* the HOUSEPOWER idea, and provide a backlog of public acceptance to assist the contractor, the dealer and the utility representative at the selling level. This will be kicked-off during "Electrical Week" (Feb. 10-16).

• Short-range, local selling-action programs that will take advantage of the pre-selling done by the mass advertising job, converting the amassed consumer education in sales and rewired homes. Two local selling-action programs are scheduled—one for spring, the other for fall.

The first part of the program, the national consumer motivation part, will be put into effect using the following: EEI plans a series of full page ads in two of the biggest magazines, Saturday Evening Post and Better Homes and Gardens, to tell the basic educational story of HOUSEPOWER. This will be followed up by activity on the part of other industry associations. National Adequate Wiring Bureau, in addition to a national advertising campaign of its own, has developed the "HOUSEPOWER Rating Sheet", and is making additional promotional materials available to contractors. Live Better . . . Electrically is supporting HOUSEPOWER in national ad campaigns, closed-circuit and commercial TV, films and contractor sales kits. A third support leg comes from the National Electrical Contractors Association in additional national advertising, the development of a "HOUSEPOWER Proposal Form", and an educational campaign among its members. Lastly, the National Association of Electrical Distributors is getting behind HOUSEPOWER with promotion kits for its members.

Locally, the Spring Promotion will use Electrical Week (Feb. 10-16) as a springboard. "How's Your HOUSEPOWER Rating" is its theme; reportedly, it will bring together the HOUSEPOWER Rating Sheet (NAWB) and the HOUSEPOWER Wiring Proposal and Estimate Form (NECA) at the point of sale. Backing up the spring theme will be a national network TV show, "Home," starring Arlene Francis; a spring merchandising kit provided by EEI headquarters to the utilities; and a continuing HOUSEPOWER Forum on Residential Wiring Modernization, sponsored by the utilities to help the contractor sell-up. LBE, NAWB, and NAED will also release kits nationally in time for the Spring Selling Surge.

For the fall of 1957, a similar program is planned, with the addition of an insert in the Saturday Evening Post consisting of a four-color page followed by at least two pages of supporting ads from allied industries.

HOUSEPOWER's goal is the rewiring of 20 million homes in the next ten years.

HOUSEPOWER 1957

The following industry associations are cooperating in the HOUSEPOWER 1957 programs:

- Edison Electric Institute
- Live Better . . . Electrically
- National Adequate Wiring Bureau
- National Association of Electrical Distributors
- National Electric Contractors Association

Watch for HOUSEPOWER 1957 Advertising and Promotion Schedule to be published in EW soon.

More scope for selection

IN THE FULL LINE
OF GENERAL ELECTRIC CABLES

The General Electric line of hundreds of wires, cables, and cords covers just about every possible need. Typical of these are flame-resistant, heat-, moisture-, and weather-resistant types and special constructions to withstand vibration, the electrostatic effects of adjacent power cables—even the effects of atomic radiation. Thus, G-E engineers are never limited to one cable, cord, or wire for a given job but can suggest the most efficient and economical solution for the particular situation.

This is one of the important reasons why General Electric wire and cable engineers have been able to help many electrical contractors with their electrical expansion and modernization plans for industrial customers. Another reason is General Electric's knowledge of the requirements of other basic components of power distribution systems—transformers, load centers, switchgear, etc. — and the importance the right wire or cable plays in satisfactory system performance.

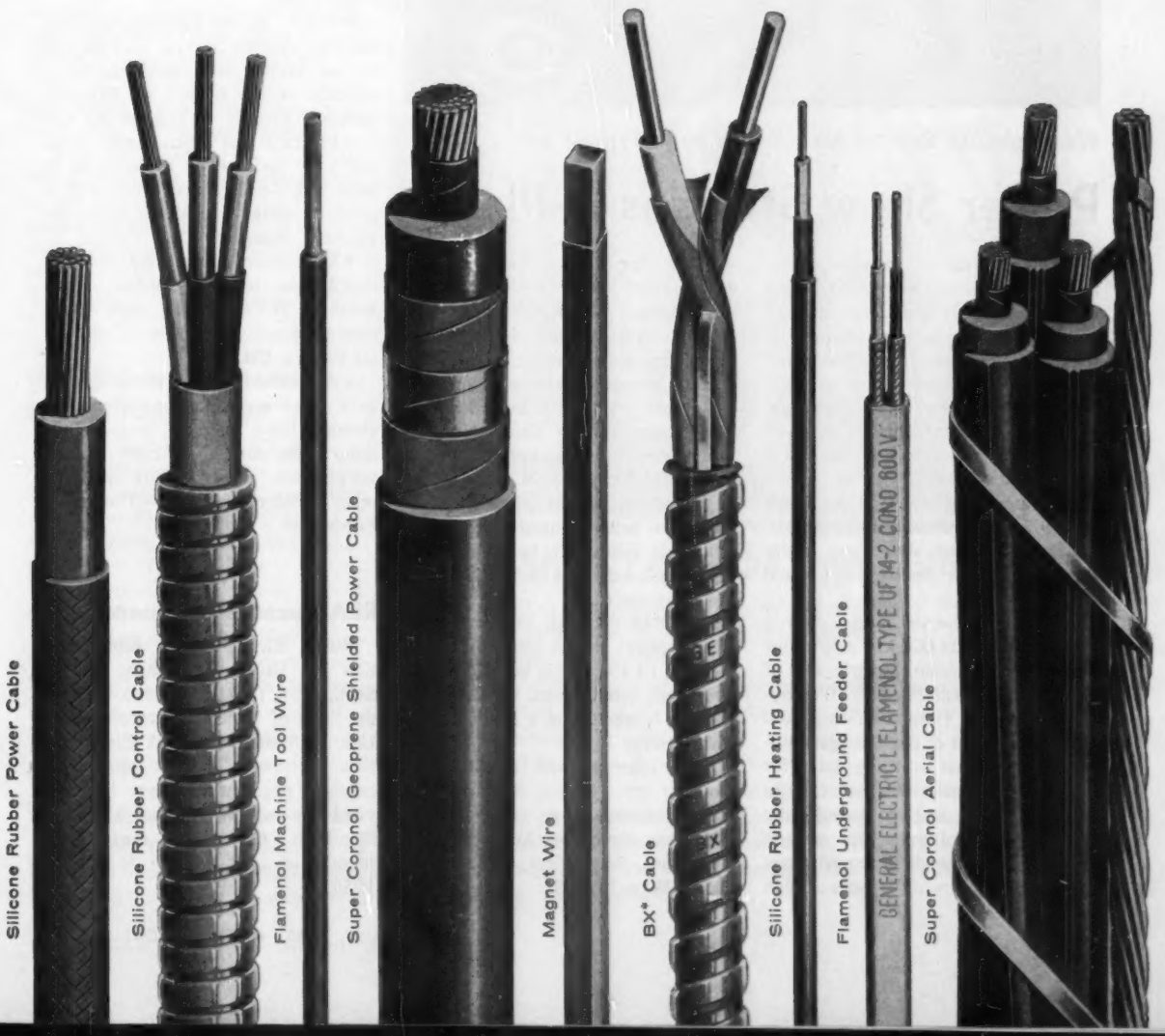
All this adds up to experience . . . the kind that can benefit you. Next time you have a cable selection problem it will pay to take advantage of General Electric's knowledge and experience.

For information on your specific wire and cable application or selection problem see the G-E wire and cable specialist in your locality or write to Section W183-1227, Wire and Cable Department, General Electric Company, Bridgeport 2, Connecticut.

*Registered Trade-mark General Electric Company

Progress Is Our Most Important Product

GENERAL ELECTRIC


Silicone Rubber Power Cable
Silicone Rubber Control Cable
Flamenol Machine Tool Wire
Super Coronol Geoprene Shielded Power Cable
Magnet Wire
BX* Cable
Silicone Rubber Heating Cable
Flamenol Underground Feeder Cable
GENERAL ELECTRIC L FLAMENOL TYPE UF 14-2 COND 600 V
Super Coronol Aerial Cable

Westinghouse Reactor Model Display is Typical as . . .

Power Show Stresses A-Plants

Many exhibits of research equipment and advanced engineering projects added up to a packed refresher course for engineers and visitors at the 22nd National Exposition and Mechanical Engineering held Nov. 26-30 at the New York Coliseum. Some 250 manufacturers reserved space and the week's attendance was an estimated 30,000 visitors.

The atomic displays at the show were of great interest to utility people. Among the models of nuclear power stations and their auxiliary equipment were:

1. A pressurized-water reactor electric plant with a 134,000-kw output for the Yankee Atomic Electric Co of New England, exhibited by Westinghouse Electric Corp. Westinghouse also had a model of the homogeneous-type reactor that is being built for Pennsylvania Power & Light Co. In addition, they had a hermitically sealed centrifugal pump for sodium or other liquid metals at temperatures up to 1,600 F, flowing at rates as high as 5,000 gpm; and a coolant pump for water under 580-F, 2,000-psi conditions flowing at 18,300 gpm. This latter pump will be used in the AEC's Shippingport, Pa., nuclear plant.

2. First privately financed atom plant —a model of Consolidated Edison's 236,000-kw Indian Point Nuclear-Steam electric generating station to be built at Buchanan, N. Y.

3. A sodium reactor plant rated at 20,000 kw being planned for Southern California Edison Co by Atomics International, a division of North American Aviation Co.

4. An OMR (Organic Moderated Reactor) plant model—the plant, to produce 10,400 kw, is being designed by Atomic International for American Foreign Power Co in a Latin American country.

Two other power developments were:

• A closed-cycle gas turbine power plant was shown by American Turbine Corp, New York, licensors of Escher Wyss in U. S.

• Public Service Electric & Gas Co exhibited a scale model of its Linden station, which is expected to be operating in 1957. This station, having two 235,000-kw generating units, will buy oil from a nearby refinery and will sell steam to the refinery to be used in the latter's processes.

The show also had a number of developments produced by electrical manufacturers. Among them . . .

• An "integrated" field coil in a re-enforced glass laminate structure reported to give full protection against atmospheric contaminants — Allis-Chalmers Mfg. Co.

• A 25,000-kva, 5-kv air circuit breaker with splitter plates which expose large areas for the propagation of the arc. The unit has front steel plate that closes against angle irons in switchgear cell to make a "dead front" arrangement—Federal Pacific Electric Co.

• Motor of the squirrel-cage type has part-winding starting, may be said to be similar to 2-step resistance starting; ratings from 5 to 200-hp—Reliance Electric & Engineering Co.

• Machine tool control relay, rated 100 amp and 600 v, available in 2-pole and 4-pole types; relay with a greater number of poles is being developed—Square D Co.

• Switchgear cabinet for 600-volt distribution include Cordon circuit breakers (I-T-E) when high interrupting capacity is needed—Continental Electric Co.

• An indicating and alarm system, as a silent watchman against critical changes, has a "safe-on" lamp. When lamp goes out, it indicates a high temperature, power failure or some other circuit malfunction—Thomas A. Edison, Inc.

REA Issues Supplement

Rural Electrification Administration has issued Supplement No. 1, Sept., 1956, to REA Bulletin 43-5 for the "List of Materials Acceptable for Use on Systems of REA Electrification Borrowers." This supplement contains pages which have been revised by action of the Technical Standards Committee during the months of July through September, 1956.

Water-Cooled Stator Coils Used in 30-Mw Generator

London—(McGraw-Hill WORLD NEWS)—Metropolitan-Vickers Electrical Co, Ltd, has recently completed tests on a 30,000-kw water-cooled turbogenerator at the company's Trafford Park works in Manchester, England. With the completion of these tests, the company thinks that a major advance in electric generator design has been developed to the point at which it can be put into commercial use. The water-cooled unit is believed to be the first such machine in the world. It is expected to be supplying power to the national grid by the end of 1956 or early 1957.

This 30,000-kw, 11,800-v, 3,000-rpm generator is to be installed in the Central Electricity Authority's Bold power station at St. Helens. It will operate alongside normal air-cooled machines already installed there.

The stator winding of the generator is cooled by circulating water through the coils, reportedly in direct contact with the live copper at 11,800 v. Rated at 37,500 kva, it has already been tested at approximately its rated load, using distilled cooling water.

With the exception of its water-cooled winding, it is an exact duplicate of the two previously mentioned air-cooled machines. Its winding was designed to fit into the same size stator core and slots.

U. S. Rubber to Spend $40 Million in 1957

United States Rubber Co plans to invest about $40 million for expansion and modernization in 1957, compared with about $31 million this year and $35.5 million in 1955, stated H. E. Humphreys, Jr, president.

Humphreys also forecast record rubber industry sales of $6 billion in 1957, and an annual rate of $7 billion by 1960. He said that 1956 sales will be about $5.5 billion, almost identical to 1955.

Walworth Plans New Plant

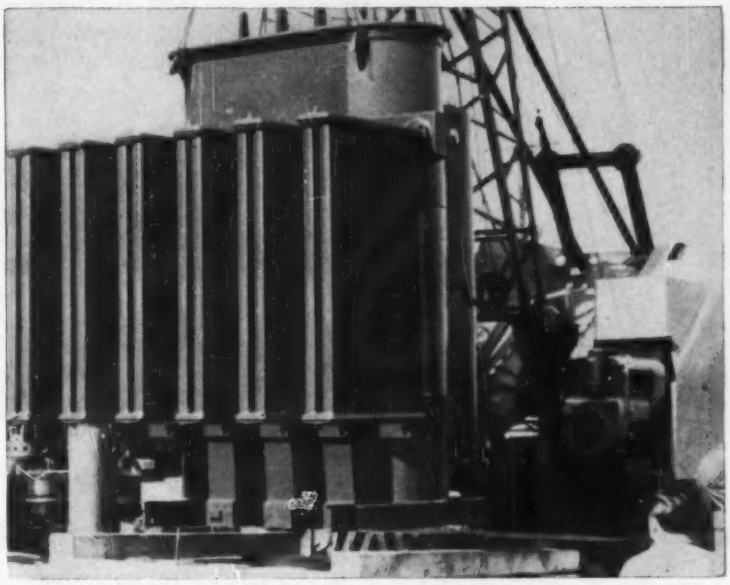
Walworth Co, for over 70 years located in South Boston, Mass., plans to build a new valve manufacturing plant and a research building totaling about 300,000 sq ft of floor space in South Braintree, Mass. Estimated cost is about $5 million. If the proposal is approved at a special town meeting this month, construction of the new facility is expected to begin early in 1957.

A-Fuel Study by Du Pont

E. I. du Pont de Nemours & Co states it will undertake a design study and development work to determine the feasibility and economics of heavy-water moderated reactors for electric power generation. Particular attention will be paid to the utilization of natural uranium as fuel. The study will be made for the AEC. No commitment was made for the construction of a power reactor.

GE Developments

- An order to design and build a 190-ft roller hearth furnace for Marion Malleable Iron Works, Marion, Ind.
- Selection as one of two U. S. firms to design, manufacture and furnish consulting engineering services to Venezuela's first atomic reactor.
- Demonstration recently of GE's experimental parallel-to-roadway fluorescent lighting system near Hendersonville, N. C.
- Announcement of plans to establish the company's Computer Department at Phoenix, Ariz.
- Formal opening of Construction Materials Division's Great Lakes District regional warehouse and sales office at Cleveland, Ohio.
- Formation of the Communications Products Dept at Syracuse, N. Y., to absorb functions of former Communications Equipment Section.



Marcus Ships Large OA Transformer

This 3,000-kva transformer is one of the first of a Type TLS line manufactured by Marcus Transformer Co., Rahway, N. J. It's destination is the Philadelphia Convention Hall.

The unit is the largest oil-filled design that the company has made, being rated Class OA, 55C rise, 3-phase, 60 cycles, 13,200v with two 2½% taps (above and below), 480v. Shipping weight is 26,000 lb including oil and bushings.

Four significant features of the design are: Primary coils are continuous double disc wound; core is cold-rolled grain-oriented steel; air expansion chamber compensates for temperature changes in oil; and three coats of paint applied over a shot-blasted surface to provide protection against weather and corrosion.

BUSINESS OUTLOOK

Electrical World

DECEMBER 17, 1956

Capital expenditures in 1957 will be greater than ever before. This is what the current McGraw-Hill survey of Business' Plans for New Plants and Equipment shows—and previous experience has proved it to be an excellent indicator of this dynamic factor in the economic outlook.

Business plans to spend $40.2 billion next year on new plants and equipment—$4 billion dollars over the current estimate of what is being spent this year. Part of this will reflect the increase in the cost of capital goods, but much of it will be in terms of real physical output.

Even though business plans to boost capital spending by 11% next year, **this represents a bit of a slowdown in the business spurt of this year.** Spending on new plants and equipment jumped 21% this year over last year's figure.

And even the 11% increase planned for 1957 may not be met in full. **Business may not be able to get the funds it needs.** The money market is still tight and there's no clear indication as to when it will loosen up.

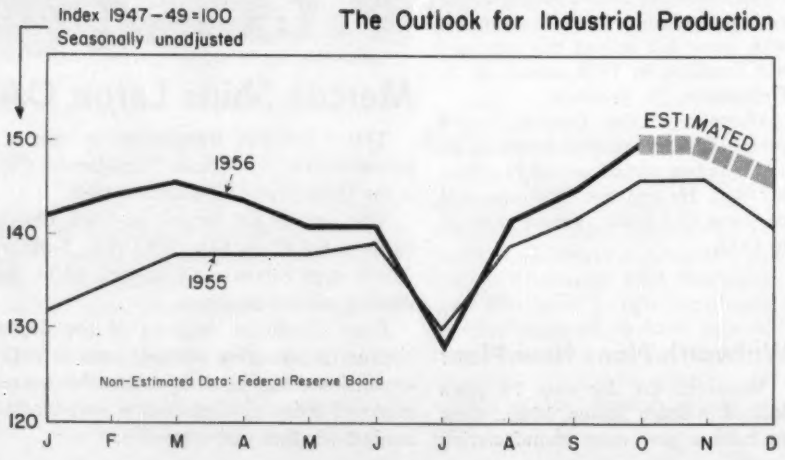
Furthermore, **there's the chance men and materials just won't be available in sufficient quantities.** Some sectors of the economy have been jumping close to ceilings, especially steel, machinery and other capital goods. Just as some plans for 1956 had to be postponed into 1957, some of those for 1957 may be pushed into 1958, simply because equipment deliveries couldn't be made as scheduled.

• • •

On the other hand an unsettled international situation may cause some shifts in plans, and it's entirely possible new ones will develop. Yet, so far, neither the elections nor Suez has had any significant effect on basic plans. Only 3% of the companies reported in the McGraw-Hill survey that their plans had been changed as a result of the election returns.

Despite all these restraints and uncertainties, technological change and management's keen desire to stay abreast of it should result in a continual and gradual increase in capital spending all through 1957. Such a result would be all the more likely if profits keep rising along with business activity and if some tax incentives, such as favorable rulings on depreciation allowances, are provided.

The Outlook for Industrial Production



"SNAP IN-SNAP OUT" INSERT DIES ARE EXCLUSIVE FEATURE OF NEW KEARNEY 0-51 and 0-52 TOOLS FOR COMPRESSION FITTINGS

Now, with new Kearney 0-51 and 0-52 lever-action Tools, install the *widest range* of compression sleeves and fittings—faster, more conveniently. And Kearney's original, *exclusive* "SNAP IN-SNAP OUT" interchangeable insert dies give you greatly increased efficiency of operation!

Easiest Dies to Change

Die-changing is swift and simple. No tools needed. No screws to tighten. Self-aligning die halves "snap in-snap out" with two-finger ease. There is utmost rigidity in operation because each die part locks in its rectangular seat by a shoulder and a groove, and is held in place by spring locking pins.

Widest Range of Compression Connections

Extra size range is an exclusive feature of the Kearney 0-51 and 0-52 Tools. You can use them for making line connections with Squeezons, L-Taps and T-Taps, also for installing Serv-Ens and Splicing Sleeves on distribution conductor sizes most frequently used.

Conveniently positioned in the jaw nose is the fixed die for installing Serv-Ens and L-Taps. The insert dies seat close to the fulcrum pins so minimum effort is needed on tool handles. Insert dies are available to install sleeves and Squeezon fittings for most wire sizes used on distribution systems. Wire cutter dies, also available, snap into same seat as the dies. These new tools are lightweight and rugged, safe for use on energized circuits at distribution voltages. The cost is so low you'll want one on every line truck.

FOR BETTER CONSTRUCTION...SAFER MAINTENANCE

Specify **KEARNEY PRODUCTS**

Write today for Bulletin 13.

JAMES R. KEARNEY CORPORATION

4224-42 Clayton Avenue, St. Louis 10, Missouri

Canadian Plant: Guelph, Ontario

-338

IBEW Quietly Marks Its 65th Anniversary

With little fanfare the industry's largest union late last month marked its 65th anniversary. For the 650,000-member International Brotherhood of Electrical Workers, the event was another source of pride.

Like any dynamic organization with that much history behind it, the IBEW has had its ups and downs. It has felt the blow of depression and suffered the hardships of an empty purse. But today the union appears to be enjoying a period of comfortable prosperity.

In all, the union claims to have added just under 100,000 new members this year. With deaths, retirements, and normal turnover, the union's top officers estimate it will have a net gain of something like 65,000 for the year.

IBEW Thought of as "Good Citizen"

Leadership of the union today is shared by President Gordon M. Freeman and Secretary Joseph D. Keenan. They head a staff of 190 members, quartered in one of Washington's more modern buildings, not many blocks from the White House. Like a number of other trade unions, the IBEW enjoys a national reputation for being a quiet, responsible, good citizen. But the success of this year's membership drive indicates that it has energy and appeal.

Freeman and his predecessors, notably Dan Tracey, who served some 14 years in the top union job, have spoken out strongly against public and federal ownership of electric generation and distribution facilities. They have argued that free labor can deal reasonably and equitably with free enterprise—but that it cannot expect an even break with government-owned utilities.

On occasion these union spokesmen have argued more bluntly and probably more effectively the case for free enterprise than have some industry spokesmen. In taking such a stand, these IBEW leaders have had to oppose the views of both the American Federation of Labor and the Congress of Industrial Organizations.

Union Organized in St. Louis

Birth of the IBEW dates back to November 28, 1891, when 10 delegates representing some 300 or so workers met in solemn convention at Stolley's Dance Hall in St. Louis. The first electrical workers union had been organized in that city a year earlier as an AFL local (No. 5221). L. Henry Miller of St. Louis was president of the local and later was to become a leading light in organizing the IBEW which was at first called the National Brotherhood of Electrical Workers. Miller devoted his first year to organizing more locals. By the second convention—held in Chicago in 1892—the union could claim 43 locals with some 2,000 members. There were occasional setbacks—in 1895 the union membership dropped down to eight locals and only 11 delegates showed up for the annual convention held in Washington.

That proved to be the low point. The IBEW managed to weather the storm and came out of it to grow into the large organization it is today.

TECHNICAL NOTES

Stability of the oxide surface which forms on aluminum alloy line hardware makes it highly resistant to atmospheric corrosion.

Reactor size is fixed by nuclear-physical factors, but the power level at which it runs is limited only by difficulties of heat removal.

Unit cost estimating in the distribution division of Southern California Edison Co is providing the means to (1) determine variations between planned and actual construction costs, (2) select the proper-sized crew for particular jobs, (3) provide a standard method of producing material requirements, and (4) allow packaging and readying materials in advance of need. The estimating procedure uses average values and has served to stimulate the line crew foremen to meet or better averages.

Centralized control of a major steam plant built in 1948 by a western utility will return the installation cost of $1 million over a five-year period through reduction of operating manpower. Control boards for boilers, turbines, and auxiliaries will be duplicated in a well-lighted, air-conditioned, central control room. Centralized control also will free trained operators from the older plant for positions at the utility's newer steam plants.

Converting 4-kv distribution to 12 kv can seldom be justified except when combined with system reinforcement or rebuilding.

Rate Changes Contemplated

Florida P&L's rates will go up 2⅛%. TVA's rates to distributors and industrials up 1/100 of a mill per kwhr. Commonwealth Ed plans new water heating rate

Three rate changes are being planned or will be put into effect shortly by the electric utility industry.

Because of an oil shortage created by the Suez Canal situation, Florida Power & Light Co will put into effect about Jan. 1, a rate increase of 2⅛%. This increase will be allowed under an inflationary adjustment clause on file with the Florida Railroad and Public Utilities Commission. This clause can lower or raise rates automatically with the rise and fall of the commodity index and the cost of fuel oil.

The increase, an FP&L spokesman said, can be averted only if the price of oil returns to its former level in the next few days.

The company has been fluctuating its rates for several years on the basis of the adjustment clause, but most of the changes have been slight.

The last change, because of an increase in the commodity index in September, was effective on Nov. 10 and increased rates ⅛%.

Tennessee Valley Authority will increase power rates to large distributors and industrial users. The increase will be made in the escalation clause and will go up from three one-hundredths of a mill per kwhr to four one-hundredths. TVA said that this revision will increase customers bills by less than 1%.

Commonwealth Edison Co has asked the Illinois Commerce Commission approval to revise its residential rate schedule providing a charge of 1.5¢ per kwhr for water heating service on a 24-hr a day basis.

Company studies indicate that new 40-gal. electric water heaters with two 4,500-w heating elements are capable of meeting the requirements of homeowners, including those with automatic dish and clothes washers.

Under the proposed rates, customers would be billed for water heating service on a "floating block" principle, which is based on average usage. The number of water heating kwhr would be established each month as 2/3 of a customer's total usage in excess of 100 kwhr. This water heating block would be limited to 500 kwhr monthly.

For example, a water heating customer whose total monthly usage is 400 kwhr, would have a floating block of 200 kwhr (2/3 of the excess over 100). These 200 kwhr would be billed at 1.5¢.

The present controlled rate for water heating will be continued for customers, the application said, who prefer it to the new uncontrolled rate. Under this plan customers utilize water heaters with extra-large storage capacity and time-controlled heating units. Water is heated during the night for a charge of 1.05¢ per kwhr and stored up for use the next day.

Federal Savings Given Consumers

Calculated savings resulting from purchases of government power during 1956 will be distributed by Otter Tail Power Co to all its customers, Pres C. G. Wright has announced.

In compliance with the company's contractual agreement with the federal agency the savings is being passed on to all customers. These net savings amount to $100,000.

Each customer's portion of this savings will appear as a credit on his electric service bill and will be designated as "Annual Savings from Purchase of U. S. A. Power." For the majority of Otter Tail residential customers, this credit will amount to about 50¢.

The actual method of computing the net savings from the purchase of government power, Wright said, is complicated. Briefly stated, it is the difference between the company's average fuel costs per kwhr and the rate per kwhr charged by the federal government. This gross savings is further adjusted to absorb the fixed charges on the additional investment made necessary by the interconnection.

The resulting net savings is calculated monthly and accumulated for a year. Should federal power continue to be available to the company, Wright said, this savings will be distributed to all customers once a year as a credit on their December electric service bills.

FINANCIAL BRIEFS

Savannah Electric & Power Co is planning to split its common on a 2-for-1 basis . . . Halsey, Stuart & Co, Inc, group won $20 million **Long Island Lighting Co** first mortgage 4¾% bonds due 1986 with a bid of 101.60%; reoffered at 102.75% to yield 4.58% . . . **Georgia Power Co** has asked Public Service Commission approval to borrow $11 million in short-term bank loans. The funds will be used to buy out the Georgia Power & Light Co.

Common Stock Dividend Increase—Middle South Utilities, Inc, will pay Jan. 2 a quarterly dividend of 40¢ a share as compared with 37½¢ in the previous quarter . . . Atlantic City Electric Co will pay Jan. 15 a dividend of 32½¢ a share versus 30¢ previously.

Loved "Employee" Dies

Mooch, the Heinz 57 varieties pooch who gained fame earlier this year (EW, Nov. 19, p 63) when she was placed on the payroll of Southwestern Public Service Co, died recently. Her death came peacefully at Cunningham Station after an operation in a Hobbs, N. Mex., pet hospital and three blood transfusions. Mooch had been ailing since she was bitten by a rattler a few years ago. Fellow workers oversubscribed the $80 hospital bill, so they used the extra money to buy flowers.

Future Financing

Bond Costs: Up

Bond costs continued in a steep climb and rose approximately 1/5% in the past month. The high point to date for an electric company's mortgage bond rated "A" is 4.65%. This is the price Long Island Lighting Co is paying on its offering of $20 million first mortgage bonds. The issue was sold to investors on a 4.58% basis.

January: A Busy Month

January will be a busy month. Electric utilities have already scheduled over $200 million. Telephone companies will add $75 million to the calendar. The Trans-Canada Pipeline Co offering is expected in this month.

Common Offerings: Light

Utilities have been avoiding financing with common stock. However, a few large issues will be made in March—common offerings by General Public Utilities Corp and West Penn Electric Co are expected that month.

Due Diligence Meetings

Jan. 4, Pacific Power & Light Co; Jan. 11, Louisiana Power & Light Co, and Jan. 17, Atlantic City Electric Co.

(Furnished by the Irving Trust Co from the Financing Calendar)

DATE DEC.	COMPANY	Amount of Offering (Millions) DEBT	EQUITY
No Date	Massachusetts Port Authority	$115.0-C-R	$.....
4th Quarter of 1956 (Month not indicated)			
	U. S. Rubber	50/60.0- -cv-rt	.....
	North Carolina State School	25.0	.....
	J. P. Stevens	30.0-P	.....
	Ohio Thoroughfare Revenue	50.0-C	.....
	Sacramento Utility District	85.0	.....
	Grand River Dam Auth., Okla	27.0	.....
	Hetch Hetchy, California	54.0	.....
	New York State Grade Crossing	25/40.0	.....
	Missouri State	75.0	.....
JAN.			
7	General Telephone of California	.....	5.0-N Pfd
7	Idaho Power	20.0-C	.....
8	New England Telephone & Telegraph	35.0-C	.....
9	Pacific Power & Light	20.0-C	9.0-C Pfd
15	Louisiana Power & Light	20.0-C	.....
16	U. S. Governments	1,600.0-R	.....
17	Oklahoma Gas & Electric	20.0-C	.....
21	Southwestern Gas & Electric	10.0-C	.....
22	Pacific Gas & Electric	35.0-C	.....
23	Atlantic City Electric	10.0-C	.....
29	Mountain States Telephone & Telegraph	35.0-C	.....
JAN.			
No Date	New England Power	10.0-C	.....
	Niagara Mohawk Power	50.0- -cv-rt	.....
	Douglas Aircraft	25.0-N-cv	.....
	Socony Mobil Oil	100.0-N	.....
	Sears Roebuck Acceptance	50.0-N	.....
	May Department Stores	25.0-N	.....
FEB.			
4	Public Service of Oklahoma	10/12.0-C	.....
15	U. S. Governments	9,000.0-R	.....
FEB.			
No Date	Consolidated Edison	55.0- -cv-rt	.....
MAR.			
15	U. S. Governments	3,000.0-R	.....
MAR.			
No Date	General Public Utilities	.....	23.0- -rt COM
	West Penn Electric	.....	10/11.0-C-rt COM
	Appalachian Electric Power	24.0-C	.....
	Southwestern Public Service	.....	7.3-N-rt COM
1st Quarter 1957 (Month not indicated)			
	Northern Natural Gas	24.0-N	.....
	Indianapolis Power & Light	.....	6.0-N Pfd
	Washington Gas Light	.....	5.0-N Pfd
	Pioneer Natural Gas	15.0-C	.....
	Kentucky Utilities	.....	4/6.0- -rt COM
	Southern Counties Gas	15.0-C	.....
	Kansas City Power & Light	20.0-C	.....
	Metropolitan Edison	18/20.0-C	.....
	Rochester Gas & Electric	12.0-C	.....
	Otter Tail Power	5.0-N	.....
	Philadelphia Electric	30.0-C	.....
	Hawaiian Electric	7.0-P	.....
	Southern Indiana Gas & Electric	5.0-C	.....
	Elizabeth River Tunnel, Va	43.0	.....
	Western Light & Telephone	.....	1.5- -rt

Symbols: C—Competitive; N—Negotiated; P—Private; R—Refunding; cv—Convertible rt—Rights; Pfd—Preferred; COM—Common.

NEW!

Alcoa Aluminum integral-web channel bus

(PATENT PENDING)

Major new development in bus conductor offers maximum protection against short-circuit forces in high-current systems.

Strong as a girder, easy to install, high in current-carrying capacity, Alcoa® Aluminum Integral-Web Channel Bus Conductor offers pronounced advantages over other types of conductor for such applications as generator leads, substation bus and industrial plant use.

Its integral-web construction eliminates need for spacer clamps or welded bars across channels. The special extruded shape gives a large surface area to accommodate high current in either ac or dc circuits. Its high section modulus provides the mechanical stiffness needed to resist the forces of short circuits without damage or distortion.

Joints, taps and splices can be clamped, bolted or welded. Special grooves mark exact center lines for drilling bolt holes so that nuts lock in recesses designed to eliminate back-up wrench. Channels, plus vent holes in center web, provide high degree of ventilation, cooling and drainage.

For complete information, contact your Alcoa repesentative or write Aluminum Company of America, 2306-M Alcoa Building, Pittsburgh 19, Pa.

SIZES	NOMINAL CURRENT* (amperes)
4 x 6	3,500
5 x 6	4,000
8 x 8	7,000
11 x 11	10,000
12 x 12	12,000

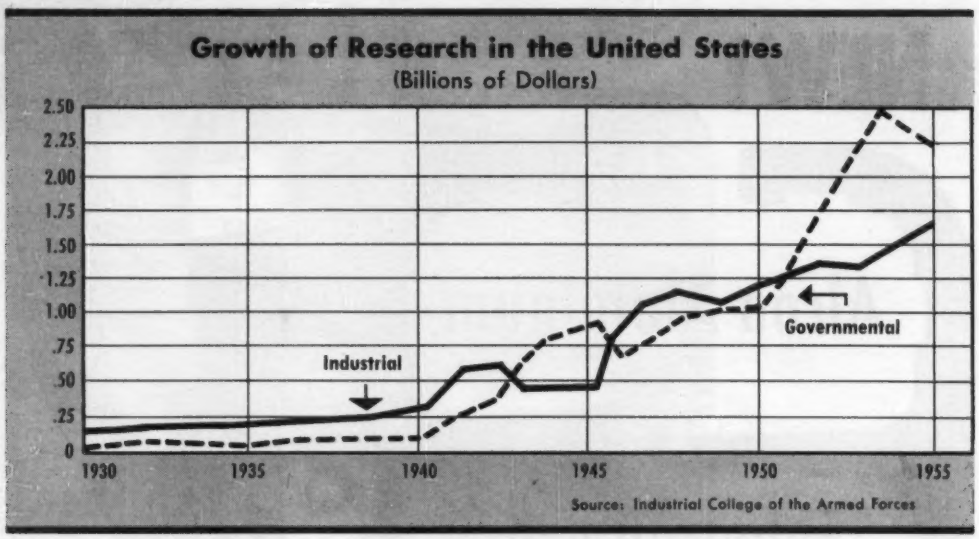
*(based on 30° C rise above 40° C ambient still air)

THE ALCOA HOUR
TELEVISION'S FINEST LIVE DRAMA
ALTERNATE SUNDAY EVENINGS

ALCOA ALUMINUM
ELECTRICAL CONDUCTOR
ALUMINUM COMPANY OF AMERICA

Your Guide to the Best in Aluminum Value

STATISTICS



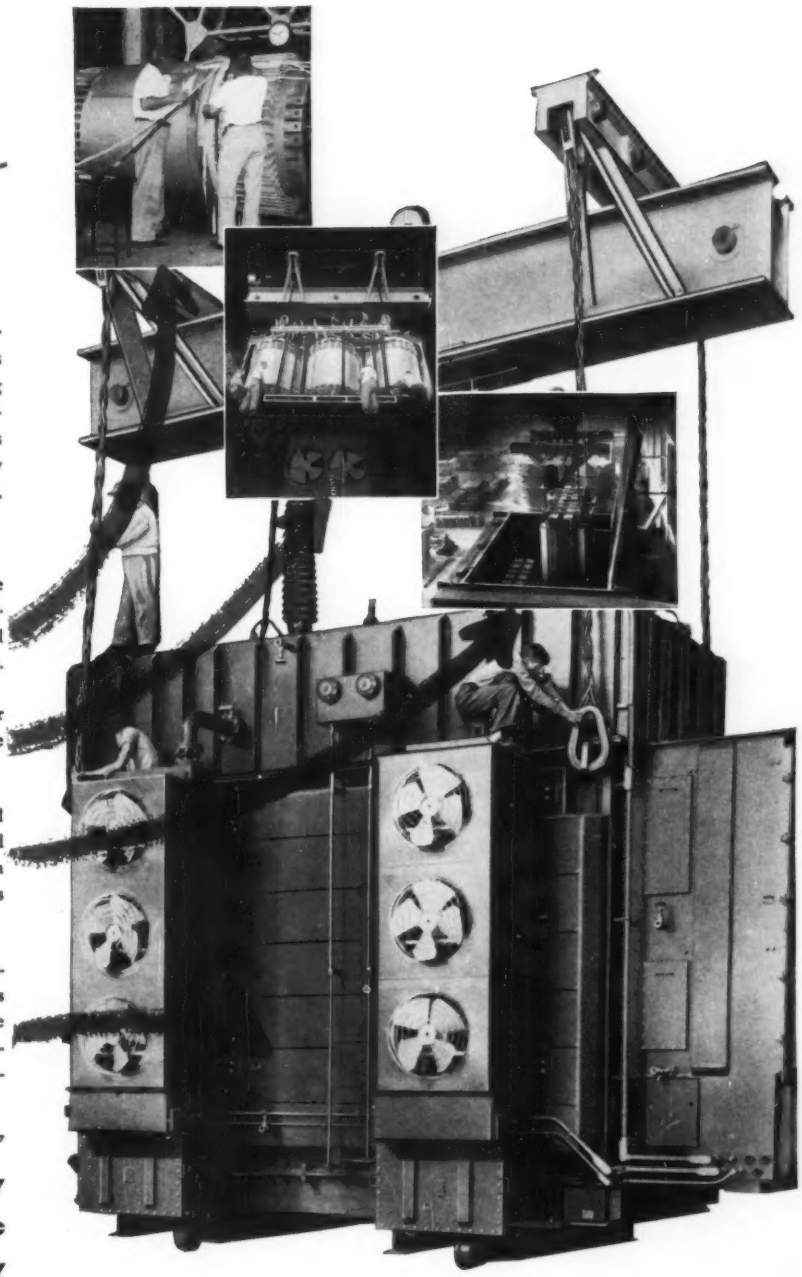
Power Statistics . . .

		Latest Month	Preceding Month	Year Ago	Annual Change %
Capacity	Sept.	118.66	118.01	110.91	7.0
Peak—Class 1 Systems. million kw	Sept.	96.5	98.0	90.1	7.1
Estimated Dec. '56 Peak	Sept.	106.17	106.10	104.31	1.8
Production—billion kwhr	Sept.	48.82	52.19	46.33	5.4
Hydro		8.96	9.54	8.18	9.5
Fuel		39.86	42.66	38.18	4.4
Sales—billion kwhr	Sept.	46.07	46.11	43.39	6.2
Residential		11.68	11.60	10.63	9.9
Commercial		7.82	7.95	7.36	6.3
Industrial		23.86	23.78	22.72	5.0
Other		2.72	2.78	2.68	1.5
Fuel Consumption	Sept.				
Coal—million tons		12.45	13.18	12.07	3.1
Oil—million barrels		5.20	5.18	5.18	0.4
Gas—million cu ft		124.63	142.04	119.85	4.0
Net Income Class A & B Co's—$ million	Sept.	108.45	97.17	100.18	8.3
Residential Customers—millions	12 mos.	45.39	45.25	44.09	2.9
Revenue per kwhr	ended	2.61¢	2.61¢	2.66¢	−1.9
Avg kwhr per customer	Sept. 30	2,929	2,914	2,700	8.5
Avg annual bill		$76.45	$76.06	$71.82	6.4

Business Statistics . . .

Indexes: 1947–49 = 100					
FRB Industrial Production	Oct.	150	145	147	2.0
ENR Construction Cost	Dec.	147.6	147.6	141.1	4.6
BLS Cost-of-living	Oct.	117.7	117.1	114.9	2.4
New Orders for Machinery (1950 = 100)	Oct.	137.0	136.0	130.0	5.4
NEMA Sales					
Insulation materials	Oct.	170	147	156	9.0
Electric appliances		94	101	96	−2.1
Wholesale prices	Sept.				
Motors and generators		136.2	133.3	125.1	8.9
Transformers and regulators		144.8	139.7	129.2	12.1
Switchgear and fuses		157.0	153.8	146.1	7.5
GNP—annual rate—$ billion	3rd Qtr.	413.8	408.3	396.8	4.3

Step by Step to Quality



Moloney Transformers and reliability are synonymous with utilities everywhere because of outstanding operating records. Moloney engineering, experience and facilities blend to produce recognized quality to add to your system dependability.

Here's why...

Engineering design specifications are rigidly adhered to by experienced personnel using the finest facilities. In coil construction this is especially important.

Integrating coils with cores calls for skill and know-how, plus extensive facilities.

The core and coil assembly is dried thoroughly by temperature-controlled warmed dry air to prepare insulation properly for vacuum oil filling in its own tank.

After tanking, the transformers are tested to insure operating performance as specified by the utility. Desired tests are made on Moloney's elaborate and extensive equipment, regardless of the transformer's Kva and voltage rating.

MES6-27

MOLONEY ELECTRIC COMPANY

Power Transformers • Distribution Transformers • Load Tap Changing Transformers • Regulating Transformers • Step Voltage Regulators • Primary Unit Substations Secondary Unit Substation Transformers • Network Transformers • Series Street Lighting Transformers • Subway Transformers Industrial Dry Type Transformers • Capacitors • Transformers and Inductors For Electronics

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Quality Control at Allis-Chalmers

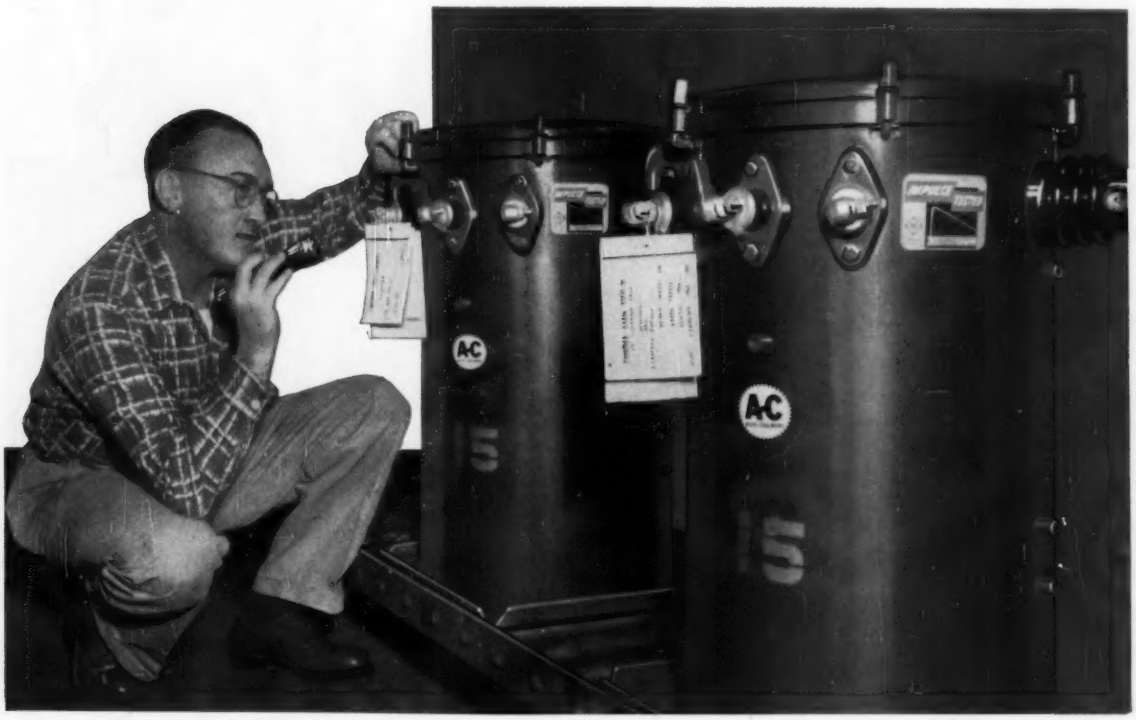
Little Things are Important, too

Inspecting high and low voltage connections to see that they are secure . . . making sure the tap changer is set correctly . . . checking the oil level . . . seeing that all gaskets are oiltight . . . measuring the gap setting on the lightning arrester . . . inspecting general appearance of tank . . . checking the nameplate data against order information . . .

Little things — all of them — but they serve to point up the depth of Allis-Chalmers quality control — the painstaking care taken to assure complete customer satisfaction. Only after passing this detailed inspection is an Allis-Chalmers distribution transformer ready for crating and shipment.

A Bulletin Tells the Complete Story

Bulletin 61B8355 on Quality Control is available from your nearby Allis-Chalmers representative. You can also get it by writing Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wis.



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A-5208